The Milroy Lectures
ON
DISINFECTION AND DISINFECTANTS.

Delivered before the Royal College of Physicians of London on March 2nd, 4th, and 9th, 1909,

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LECTURE II.[1]

Delivered on March 4th.

MR. PRESIDENT AND FELLOWS,—At the conclusion of my first lecture, I stated that with the isolation and cultivation of micro-organisms in pure culture a new era dawned in the determination of germicidal power, and instead of material of a very heterogeneous nature containing the test organisms being the subject of experiment, it became possible to work with material of a much more constant character. At the same time it is to be noted that this very simplification of method introduces at the same time a fallacy—viz., that the germicidal power of a substance is not determined on the micro-organism in its natural habitat, and a fictitious value may therefore be arrived at.

I now pass to the consideration of methods devised for the determination of the germicidal power of disinfectants.

In the first place it is necessary to point out that the determination of germicidal power—i.e., disinfectant value of various substances, is beset with difficulties which even now, in spite of the large amount of work which has been done on the subject, are by no means yet surmounted. And I will just briefly summarise some of these difficulties before proceeding to consider the methods that have been employed to determine the germicidal power of disinfectants. Many of these difficulties and the conditions which influence the result were well stated by Sternberg 20 years ago, though some have of late been brought forward as new facts.

In the first place, if the test by subculturing into suitable sterile nutrient media be employed to ascertain whether the test organism has been killed or no it is evident that if the substance has a high inhibitory action in preventing growth, if more than a certain amount of the substance be transferred over to the subcultures, growth may not ensue owing to inhibitory action, although the organism may not be destroyed. This is particularly the case with corrosive sublimate, which not only has a very marked inhibitory action in minute traces, but also seems to form loose combinations with the bacterial cells, preventing growth, though not necessarily killing.

Geppert[2] was the first, I believe, to correct the exaggerated notions which once prevailed of the potency of corrosive sublimate as a germicide, notions mainly due to the work of Koch. Geppert pointed out that a source of error was a failure to guard against the transportation with the bacteria which have been exposed to the action of corrosive sublimate of enough of this substance to prevent the growth of the organisms in the nutrient medium intended to determine whether or not they had been killed. To remove the minute quantity of sublimate adherent to bacteria in disinfection experiments with this agent Geppert employed ammonium sulphide to precipitate the sublimate in the form of the inert sulphide, and in all recent work with this substance a little ammonium sulphide or, better, hydrogen sulphide is added to the subcultures.

The far greater *resistance of spores* as compared with the vegetative bacterial cells without spores has been known since the early "eighties" of the last century, but we owe to Boer and to Sternberg in particular the appreciation of the fact that different *non*-sporing species show a very *variable resistance* to disinfecting agents. Thus with the anthrax, diphtheria, glanders, typhoid, and cholera organisms, Boer found that the strength of the disinfectant which killed these organisms with an exposure of two hours to its action for carbolic acid varied from 1 in 200 to 1 in 400, for hydrochloric acid from 1 in 200 to 1 in 1350, for nitrate of silver from 1 in 4000 to 1 in 20,000, and for the double chloride of gold and sodium from 1 in 400 to 1 in 8000. Moreover, an organism which is very susceptible to the action of one disinfecting agent may not be so susceptible to the action of another which is equally potent with the first on some other organism. That is to say, if two germicides X and Y in concentrations C_1 and C_2 have an equal germicidal effect on some particular organism it by no means follows that the same relation will exist when they are tested on some other organism.

With regard to the high resistance which spores show to the germicidal action of heat and disinfectants I am not aware that any explanation has been offered. Spores undoubtedly have a membrane which to a large extent prevents the entrance of staining agents into the interior, and this factor may partly, perhaps wholly, explain the resistance of spores to the action of disinfectants. It can hardly explain, however, the high resistance to heat, for this would suggest that the spore membrane is an extraordinary insulator to heat. A few experiments I have made, and which are being continued, suggest that the protein substances of sporing bacterial cells have less tendency to heat coagulation than the same substances derived from non-sporing organisms which are easily coagulable by heat. Thus the extracted intracellular proteins of the typhoid and cholera organisms coagulate at from 50° to 55°, while the proteins of the spores of *Bacillus megaterium* coagulate at 80° C.

Assuming, as we may legitimately do, that heat owes its disinfectant action partly at least to its coagulating power on bacterial proteins, we can understand how it is that moist heat is more efficient than dry heat apart from its greater penetrative power. It is well known that protein in the dry state coagulates at a much higher temperature than it does when moist, hence moist heat will cause coagulation of bacterial protein at a relatively lower temperature than dry heat.

The *number of bacteria* to be destroyed is not a negligible factor, and, as Sternberg pointed out, has often been overlooked. To destroy the bacteria in a cubic centimetre of water to which a drop of a broth culture has been added is a different matter from destroying the bacteria in a thick suspension. For example, Chick and Martin[3] found that phenol in a concentration of 8 parts per 1000 acting on the *Bacillus paratyphosus* at 21° C. gave the following results:—

187,000	organisms per unit volume were killed in			2·25	minutes.
440,000	,,	,,	,,	4·5	,,
56,000,000	,,	,,	,,	32·75	,,
66,000,000	,,	,,	,,	34·5	,,

In addition, different cultures of the same species of organisms may exhibit distinct differences in resistance to a disinfectant.

The nature and quantity of the associated matter profoundly modify the efficiency of many disinfectants. In the words of Sternberg,[4] "The oxidising disinfectants like permanganate of potash and chloride of lime not only act upon the bacteria, destroying them by oxidation, but upon all organic matter with which they come in contact, and at the same time the disinfecting agent is destroyed in the chemical reaction, which is a quantitative one. The presence, therefore, of organic material in association with the bacteria is an important factor, and if this is in excess the disinfectant may be neutralised before the living bacteria are destroyed. Other substances which precipitate the disinfecting agent in an insoluble form, or decompose it, must, of course, have the same effect. Thus the presence of sodium chloride in a culture medium would be an important circumstance if nitrate of silver were the agent being tested, as the insoluble chloride would be precipitated. And in the case of mercuric chloride and certain other metallic salts the presence of albumin very materially influences the result."

The influence of organic matter is especially marked in the case of disinfectants which act by oxidation, and potassium permanganate, while a potent disinfectant on bacteria without admixture of organic matter, may possess but a fraction of the potency when the latter is present. On the typhoid bacillus suspended in water, for example, potassium permanganate is 40 times more active than

[1] Lecture I. was published in THE LANCET of March 13th, p. 741.
[2] Berliner Klinische Wochenschrift, 1889, Nos. 36 and 37.
[3] Journal of Hygiene, vol. viii., No. 5, 1908, p. 680.
[4] Manual of Bacteriology, 1893, p. 162.

phenol; with 3 per cent. organic matter it is about equal to phenol.[5] But this action of organic matter is exerted not only on disinfectants which act by oxidation. Thus Kenwood and I found that taking the *Bacillus coli* as the test organism in its natural habitat in fæces and urine certain potent emulsified disinfectants had their activity reduced to two-thirds and one-half of their value as tested on the same organism in an aqueous suspension. The activity of phenol, however, was much less affected, in fact only slightly reduced, under these conditions.[6] I have had the opportunity also of making some experiments on organisms in their natural habitat of pus—an organism belonging to the *coli* group, the pneumococcus, the *Micrococcus pyogenes aureus*, and the *Streptococcus pyogenes*—and the results obtained (see Tables II. to VI.) show that certain potent emulsified disinfectants, which when tested on the same organisms without organic matter may be 12 or more times as active as phenol, when acting on these organisms in pus may be only two or three times as active as phenol. In the same circumstances potassium permanganate is practically useless. From these considerations it is evident that the results of the standardisation of disinfectants by tests on organisms in the absence of organic matter should be applied in practice only with a due appreciation of the facts and with what may be termed a large "margin or factor of safety"—i.e., with a considerable excess of the disinfectant, so much insisted on by Defries.

Urine, often an important constituent of matter to be disinfected, may have a very important action in lowering germicidal power. This action of urine is exerted not only on oxidising but also on some emulsified disinfectants.[7] For instance, hypochlorites are some of the most potent germicides in the absence of organic matter, and I have found that 0·005 per cent. of a solution of sodium hypochlorite containing 1·2 per cent. of available chlorine (about half the strength of the liquor sodæ chlorinatæ of the Pharmacopœia) suffices to sterilise in an hour a natural chalk water artificially infected with numbers of *Bacillus coli*. With an addition of a little sewage effluent so as to produce an artificially bad water (0·05 per 100,000 of albuminoid ammonia) five times the amount of hypochlorite was required. But admixed with urine the available chlorine of a hypochlorite is immediately yielded up and the mixture becomes inert, unless, of course, an amount (relatively very large) of the hypochlorite is added so that the substance is in excess. Even tap-water may lower the germicidal power of a disinfectant which is very active in solution or suspension in distilled water.

It is to be noted that organic matter both in solution[8] and in suspension affects the result, though the latter (in suspension) is the more important as it usually occurs in practice.[9] The influence of the admixed material may be exerted both by the adsorption of the disinfectant by particulate matter and also by the precipitation of the disinfectant by the matter in solution, it may be as an inert compound. As regards the last-named factor, I have found that natural protein solutions exert very varying precipitant effects on different disinfectants, as is shown by the following results. In all cases, unless otherwise stated, a 5 per cent. solution of the disinfectant in distilled water was used, with the exception of mercuric chloride, the L.G.B. solution of which was employed (about 1 in 1000 mercuric chloride with hydrochloric acid and anilin blue). Equal quantities of the protein and of the disinfectants were mixed together and the resultant precipitation, if any, noted. The order of precipitation is always stated as from the least to the most.

TABLE II.—*May 2nd, 1906. Pus from an Abscess near the Kidney. Contained a Pure Culture of a Small Bacillus belonging to the Coli Group.*

Amount of material and disinfectant.	Time of exposure. 10 min.	20 min.	30 min.	Remarks.
1. 10 c.c. pus, 10 c.c. 2% cyllin	—	—	—	
2. 10 c.c. pus, 5 c.c. 2% cyllin	—	—	—	
3. 10 c.c. pus, 10 c.c. 2% izal	—	—	—	Subcultures
4. 10 „ „ 5 „ 2% „	+	+	—	made in broth
5. 10 c.c. pus, 10 c.c. 10% potassium permanganate	—	—	—	incubated at 37° C. for a
6. 10 c.c. pus, 5 c.c. 10% potassium permanganate	+	+	+	week. Broth controls = +
7. 10 c.c. pus, 10 c.c. 5% phenol	—	—	—	
8. 10 c.c. pus, 5 c.c. 5% phenol	—	—	—	

+ = growth. — = no growth in the culture tubes.

TABLE III.—*May 8th, 1906. Thick Pus from a Case of Empyema, containing a Pure Culture of the Pneumococcus.*

Amount of material and disinfectant.	Time of exposure. 10 min.	20 min.	30 min.	Remarks.
1. 10 c.c. pus, 5 c.c. 5% phenol	—	—	—	
2. 10 c.c. pus, 3 c.c. 5% phenol	+	—	—	Subcultures made in broth
3. 10 c.c. pus, 1 c.c. 5% phenol	—	+	—	incubated at
4. 10 c.c. pus, 5 c.c. 2% cyllin	—	—	—	37° C. for
5. 10 c.c. pus, 3 c.c. 2% cyllin	—	—	—	a week and examined
6. 10 c.c. pus, 1 c.c. 2% cyllin	—	+	+	microscopically.
7. 10 c.c. pus, 5 c.c. 2% izal	+	—	—	Broth controls
8. 10 „ „ 3 „ 2% „	—	+	+	= +
9. 10 „ „ 1 „ 2% „	—	+	+	

+ = growth. — = no growth in the culture tubes.

TABLE IV.—*May 16th, 1906. Thick Pus from a Mammary Abscess. Microscopically contained Cocci, Diplococci, and Short Chains of Cocci. Plated out on Agar yielded a Pure Culture of Micrococcus Pyogenes Aureus.*

Amount of material and disinfectant.	Time of exposure. 10 min.	20 min.	30 min.	Remarks.
1. 10 c.c. pus, 6 c.c. 5% phenol	—	—	—	
2. 10 c.c. pus, 3 c.c. 5% phenol	+	—	+	Subcultures
3. 10 c.c. pus, 6 c.c. 2% cyllin	+	+	+	made in broth
4. 10 c.c. pus, 3 c.c. 2% cyllin	+	+	+	incubated at 37° C. for a
5. 10 c.c. pus, 6 c.c. 2% izal	+	+	+	week, being
6. 10 „ „ 3 „ 2% „	+	+	+	shaken daily.
7. 10 c.c. pus, 8 c.c. 10% potassium permanganate	—	—	—	Broth controls = +
8. 10 c.c. pus, 4 c.c. 10% potassium permanganate	+	+	+	

+ = growth. — = no growth in the culture tubes.

A. Egg-white.—Egg-white was mixed with an equal quantity of water, beaten up and strained through muslin. Results:—*Carbolic:* Marked precipitate; mixture quite fluid. *Cyllin:* Some precipitate; mixture quite fluid. *Izal:* Much precipitate; slight gelatinisation. *Kerol:* Much precipitate; slight gelatinisation. *Lysol:* No precipitate or other alteration. *Mercuric chloride:* Slight precipitate; mixture quite fluid. *Order of precipitation from least to most:*—*Lysol*, none; (1) *cyllin and mercuric chloride*, equal; (2) *izal*; (3) *kerol*; and (4) *carbolic*.

[5] Fowler: Journal of the Royal Army Medical Corps, vol. vi., 1907, p. 6.

[6] Journal of the Royal Sanitary Institute, vol. xxvii., No. 1, 1906, p. 1.

[7] See Wynter Blyth, Medical Times, Dec. 26th, 1908.

[8] See Firth and Macfadyen, Journal of the Royal Sanitary Institute, vol. xxviii, No. 1, 1906, p. 17; and Fowler, loc. cit.

[9] See Chick and Martin, Journal of Hygiene, vol. viii., 1908, p. 686.

B. Horse Serum.—An old anti-dysentery serum. *Lysol* gave no precipitate, others a slight precipitate, no other alteration. *Order of precipitation:*—*Lysol*, none; (1) *cyllin*, *izal*, and *kerol*; (2) *mercuric chloride*; and (3) *carbolic*.

C. Horse Serum.—Fresh horse serum slightly stained with hæmoglobin. Results:—*Carbolic* and *mercuric chloride* with equal volumes of the serum produced no precipitate (2·5 cubic centimetres of serum with 5 cubic centimetres of carbolic gave a distinct fine precipitate, but a similar mixture with mercuric chloride again gave no precipitate); *lysoform* gave a slight fine precipitate; and *cyllin*, *izal*, *kerol*, and *lysol* all gave a distinct fine precipitate. *Order of precipitation.*—*Carbolic* and *mercuric chloride* none; (1) *lysoform*; and (2) *cyllin*, *izal*, *kerol*, and *lysol*, equal.

TABLE V.—*Feb. 16th, 1907. Pus containing Pure Culture of Streptococci.*

Amount of material and disinfectant.	Time of exposure. 10 min.	20 min.	30 min.	Remarks.
1. 1 c.c. pus, 1 c.c. 5% phenol	—	—	—	
2. 1 c.c. pus, 0·5 c.c. 5% phenol	+	—	+	
3. 1 c.c. pus, 0·25 c.c. 5% phenol	+	+	+	
4. 1 c.c. pus, 1 c.c. 5% cyllin	+	+	—	
5. 1 c.c. pus, 0·5 c.c. 5% cyllin	—	—	—	
6. 1 c.c. pus, 0·25 c.c. 5% cyllin	+	+	—	
7. 1 c.c. pus, 1 c.c. 5% izal	—	—	—	Subcultures
8. 1 „ „ 0·5 „ 5% „	+	+	—	made in broth
9. 1 „ „ 0·25 „ 5% „	+	+	—	incubated at
10. 1 c.c. pus, 1 c.c. 5% kerol	—	—	—	37° C. for a
11. 1 c.c. pus, 0·5 c.c. 5% kerol	+	—	—	week. Broth
12. 1 c.c. pus, 0·25 c.c. 5% kerol	+	+	—	controls = +.
13. 1 c.c. pus, 1 c.c. 5% lysol	—	—	—	
14. 1 c.c. pus, 0·5 c.c. 5% lysol	—	—	—	
15. 1 c.c. pus, 0·25 c.c. 5% lysol	+	+	—	
16. 1 c.c. pus, 1 c.c. 5% lysoform	+	+	—	
17. 1 c.c. pus, 0·5 c.c. 5% lysoform	+	+	+	
18. 1 c.c. pus, 0·25 c.c. 5% lysoform	+	+	+	

+ = growth. — = no growth in the culture tubes.

TABLE VI.—*June 28th, 1907. Thick Pus containing a Pure Culture of Micrococcus Pyogenes Aureus.*

Amount of material and disinfectant.	Time of exposure. 10 min.	20 min.	30 min.	Remarks.
1. 2 c.c. pus, 2 c.c 4·7% phenol	+	+	—	
2. 2 c.c. pus, 1 c.c. 4·7% phenol	+	+	+	
3. 2 c.c. pus, 2 c.c. 5% cyllin	—	—	—	Broth
4. „ „ 1 c.c. 5% „	+	+	—	subcultures
5. 2 c.c. pus, 2 c.c. 5% izal	+	+	—	incubated at
6. „ „ 1 c.c. 5% „	+	+	+	37° C. for
7. 2 c.c. pus, 2 c.c. 5% kerol	—	—	—	a week and
8. „ „ 1 c.c. 5% „	+	+	—	shaken daily.
9. 2 c.c. pus, 2 c.c. 5% lysol	+	+	+	Broth con-
10. „ „ 1 c.c. 5% „	+	+	+	trols = +
11. 2 c.c. pus, 2 c.c. 5% lysoform	+	+	+	
12. 2 c.c. pus, 1 c.c. 5% lysoform	+	+	+	

+ = growth. — = no growth in the culture tubes.

D. Human Hydrocele Fluid.—Results:—*Carbolic*: Distinct flocculent precipitate. *Cyllin*, *izal*, and *kerol* all gave a fine precipitate. *Lysoform*: A slight precipitate, only amounting to an opalescence. *Mercuric chloride* and *lysol*: No precipitate. *Order of precipitation*:—*Lysol* and *mercuric chloride*, none; (1) *lysoform*; (2) *cyllin*, *izal*, and *kerol*; and (3) *carbolic*.

E. Human Hydrocele Fluid (with 2½ per cent. solutions, instead of 5 per cent., as in D.).—Results:—*Carbolic* and *lysoform*: no precipitate. *Cyllin* and *kerol*: slight, very fine precipitate.

The formation of insoluble compounds by the action of the disinfectant on the matter to be disinfected may therefore profoundly modify the process of disinfection. Silver salts would be unsuitable for the disinfection of urine, on account of the chlorides which it contains, proteins form compounds with most metallic salts, and the presence of sulphuretted hydrogen would cause the formation of insoluble sulphides with salts of mercury, silver, copper, lead, &c. Heat enhances the potency of disinfectants, hence warm solutions are more active than cold ones.

Henle[10] was the first, I believe, definitely to point out the *influence of temperature* on chemical disinfection, although Koch had also noted it. Henle gives the following table of an experiment:—

TABLE VII.—*Carbolic Acid 0·5 per cent. acting on the Typhoid Bacillus.*

Temperature.	5 minutes.	15 minutes.	60 minutes.
0° C.	+	+	+
10° C.	+	+	+
22° C.	Lessened growth.	Lessened growth.	20 colonies.
30°–32° C.	60 colonies.	1 colony.	—
40°–44° C.	—	—	—
40°–44° C. (heat alone; no disinfectant)	+	+	+

+ = vigorous growth. — = no growth.

With regard to the influence of temperature he says: "The explanation of these data depends on the fact that, on the one hand, a low temperature reduces the chemical activity of the disinfectant; on the other hand, in all probability the metabolism of the micro-organisms is reduced by cold, and this naturally hinders the circulation of fluid in the interior of the bacterial cells," thus clearly recognising that the disinfecting act is a chemical process going on between the disinfectant and the bacterial cells, and likewise that the act is also influenced by physical conditions. The use of warm solutions when available is therefore to be preferred for practical disinfection, and in determinations of germicidal power the temperature has always to be taken into account.

The *time of exposure* is another important factor. As Sternberg says, "Some agents act very promptly, while others require a considerable time to effect the destruction of bacteria exposed to their action." Moreover, as Chick and Martin[11] put it, "the effect upon the time taken to kill of varying concentration is not the same with different classes of disinfectants. Two concentrations or strengths of two disinfectants, which are equally efficient, if allowed to operate for five minutes, do not necessarily bear the same relationship to one another as do two other concentrations of the same two disinfectants, which are equally efficient if the time chosen for the test is 20 minutes." They give the following results (Table VIII.).

TABLE VIII.

Disinfectant.	Time of action (mins.).	Concentration: grms. per 1000.	Carbolic coefficient.
Mercuric chloride	2·5	0·88	13·6
Phenol	2·5	12·0	
Mercuric chloride	30·0	0·018	550
Phenol	30·0	9·9	
Silver nitrate	2·5	0·068	176
Phenol	2·5	12·0	
Silver nitrate	10·0	0·015	693
Phenol	10·0	10·4	

[10] Archiv für Hygiene, vol. ix., 1889, p. 188.
[11] Journal of Hygiene, vol. viii., No. 5, 1908, p. 663.

This difference, however, is much more marked for metallic salts than with disinfectants of the phenol series; with the latter it hardly exists.

The influence of small quantities of other substances on germicidal action is very interesting and of great practical importance. Thus moisture is necessary for the activity of gaseous sulphur dioxide and chlorine; without moisture they are almost inert.

The experiments of Krönig and Paul on the influence of sodium chloride and of alcohol on the activity of mercuric chloride, carbolic acid, and silver nitrate gave striking results. Sodium chloride much reduces the activity of mercuric chloride, while it increases that of carbolic acid on anthrax spores. Thus with a 1·69 per cent. solution of mercuric chloride acting for six minutes on a certain number of anthrax spores eight organisms survived. With the same solution to which ½ per cent. salt had been added 124 organisms survived, and with 3·65 per cent. salt 1087 organisms survived (see Tables IX. and X.) (for explanation see later).

TABLE IX.—*Krönig and Paul's Table 22. Anthrax Spores.*

Solution.	Percentage.	Colonies developing after six mins. exposure.
1 $HgCl_2$ + 1 NaCl, 16 litres.*	$HgCl_2$ 1·69.	8
2 ,, + 1 NaCl ,,	HgCl 1·69 + NaCl 0·365	32
3 ,, + 2 NaCl ,,	,, + ,, 0·73	124
4 ,, + 3 NaCl ,,	,, + ,, 1·095	282
5 ,, + 4 NaCl ,,	,, + ,, 1·46	382
6 ,, + 4·6 NaCl ,,	,, + ,, 1·68	410
7 ,, + 6 NaCl ,,	,, + ,, 2·19	803
8 ,, + 10 NaCl ,,	,, + ,, 3·65	1087

* This means that one molecular weight in grammes of mercuric chloride was dissolved in 16 litres of water and similarly with the salt.

TABLE X.—*Krönig and Paul's Table 23. Anthrax Spores. The Figures in Columns 2, 3, and 4 are the Number of Colonies developing.*

Time mins.	$HgCl_2$, 16 litres = 1·69 per cent.	$HgCl_2$ + 2 NaCl, 16 litres = $HgCl_2$, 1·69 + NaCl, 0·73.	$HgCl_2$ + 4·6 NaCl, 16 litres = $HgCl_2$ 1·69 + NaCl, 1·69.
2	321	1280	—
3	—	—	1689
4	64	429	—
5	18	—	—
6	11	257	566
7	11	—	—
8	9	86	—
9	—	—	209
10	3	23	—
12	0	7	75
14	—	5	—
15	—	—	23
16	—	4	—
18	—	2	8

On the other hand, sodium chloride and other salts increase the germicidal power of carbolic acid. Thus with a 4 per cent. aqueous solution of carbolic acid 1505 anthrax spores remained alive, but under the same conditions, the same carbolic acid solution with an addition of about 5¾ per cent. sodium chloride, the number of anthrax spores surviving was only 191 (see Table XI.). This action of sodium chloride in thus enhancing the germicidal effect of phenol is partly due to an alteration in the distribution of the phenol between the water of the solution and the bacterial cells, the added sodium chloride diminishing the concentration of the phenol in the water and increasing it in the cells. Other electrolytes give a similar result (see Table XI.), but unionised salts appear to have comparatively little action.

TABLE XI.—*Krönig and Paul's Table 51 (part). Anthrax Spores.*

—	Colonies developing after 24 hours 10 minutes.
Acidum carbolicum liquefactum 90 per cent.	710
Aqueous carbolic 5 per cent.	620
,, ,, 4 ,, ...	1505
,, ,, 4 ,, NH_4Cl 1 litre	336
,, ,, 4 ,, LiCl ,,	253
,, ,, 4 ,, NaCl ,,	191
,, ,, 4 ,, KCl ,,	174

In the same circumstances the acidum carbolicum liquefactum, a 90 per cent. carbolic acid, was little more potent than a 5 per cent. aqueous solution (see Table XI.). In this instance probably a certain proportion of water is necessary for the full activity of carbolic acid, just as is the case with gaseous sulphur dioxide and chlorine gases. Alcohol, on the other hand, diminishes the activity of phenol. Thus a 5 per cent. solution, with an addition of 20 per cent. of alcohol, allows three times as many anthrax spores to develop as the 5 per cent. solution without alcohol, and a solution of carbolic acid in absolute alcohol has little germicidal power (see Table XII.).

TABLE XII.—*Krönig and Paul's Table 57 (part). Anthrax Spores.*

Solution.	Colonies developing after 33½ hours.
Phenol 5 per cent. (aqueous)	422
,, ,, ,, ,, + Alcohol 5·5 per cent.	555
,, ,, ,, ,, + ,, 10 ,,	617
,, ,, ,, ,, + ,, 20 ,,	1301
,, ,, ,, ,, + ,, 30 ,,	2752
,, ,, ,, ,, + ,, 40 ,,	2773
,, ,, ,, ,, + ,, 50 ,,	2987
,, ,, ,, ,, + ,, 80 ,,	3584
,, ,, ,, ,, + ,, 98 ,,	4480

Alcohol has a similar action on formaldehyde. It, however, increases the germicidal action of silver nitrate up to an addition of 50 per cent., but if the amount of alcohol be increased beyond this the germicidal action is diminished. Thus using a 17 per cent. aqueous solution of nitrate of silver 2635 anthrax spores developed, with an addition of 20 per cent. alcohol 1397 developed, with 50 per cent. of alcohol only three developed, but with 70 per cent. of alcohol 960 developed, and with 80–98 per cent. of alcohol the number developing was uncountable (see Table XIII.).

TABLE XIII.—*Krönig and Paul's Table 56 (part). Anthrax Spores.*

Solution.	Colonies developing after three minutes.
$AgNO_3$ 1 litre (aqueous)	2635
,, ,, ,, + alcohol 10 per cent.	2138
,, ,, ,, + ,, 20 ,,	1397
,, ,, ,, + ,, 30 ,,	165
,, ,, ,, + ,, 40 ,,	117
,, ,, ,, + ,, 50 ,,	3
,, ,, ,, + ,, 60 ,,	20
,, ,, ,, + ,, 70 ,,	960
,, ,, ,, + ,, 80–98 ,,	Uncountable.

I have dealt somewhat fully with this influence of sodium chloride and of alcohol on phenol, mercuric chloride, and silver nitrate in order to emphasise the importance of what at first sight might be considered to be unimportant details, and the list might be extended. Thus oil, grease, and

glycerine, as a rule, diminish germicidal power; in fact, as regards grease, lanolin alone seems compatible with disinfectant efficiency.

Soaps usually owe such germicidal power as they possess to the alkali which they contain—the hydrates or the alkaline carbonates of potassium and sodium. Soaps are incompatible with most disinfectants, though not with all (e.g., mercury biniodide and some emulsified disinfectants), and it should be widely known that most of the "carbolic soaps" of commerce are worthless as disinfectants.

The factors influencing disinfection which I have just briefly surveyed are of considerable importance in attempts to ascertain germicidal power; in other words, in the standardisation of disinfectants which I shall next consider. For since it is a truism that any or all of the factors which I have shown influence germicidal power may occur in practice, that is to say, in practical disinfection, it is obvious that unless some at least of these factors are introduced into our laboratory tests of disinfectants, exalted and misleading results of the efficiency of disinfectant substances may be obtained.

The first investigations on the germicidal action of various disinfectants on *pure* cultivations of micro-organisms were carried out by Koch[12] in 1881 and his work is rightly regarded as a classic. Koch tested various organisms, but in particular used silk threads impregnated with anthrax spores which were submitted to the action of the disinfectants for varying times, then washed, and afterwards planted on solid culture media. This is the *thread method* which is employed occasionally even now. About the same time Sternberg also carried out experiments on pure cultures of various organisms. His method was to mix the solution of disinfectant with an equal volume of culture and after two hours' contact one or two platinum wire loopfuls of the mixture were introduced into suitable culture media to test the question of disinfection. Wynter Blyth in 1886 used a similar method but replaced the culture by a suspension of the organisms made with distilled water. Sternberg[13] also with anthrax spores used the inoculation of animals as the test of the destruction of the organism, a method which has occasionally been employed since and one which probably gives accurate results with this organism, but is laborious and involves the use of a number of animals. Esmarch,[14] Geppert,[15] Henle,[16] and Boer[17] also made valuable contributions to the subject between 1882 and 1890, and Behring[18] in 1890 published an extensive series of experiments based on the thread method.

In 1897 Krönig and Paul devised the garnet method. In this garnets of selected and similar size are cleaned and sterilised and dipped into a suspension of anthrax spores which is allowed to dry on their surface as a thin film. The garnets are then immersed in the solution of disinfectant. A definite number is removed from the solution from time to time, gently washed in sterile water to remove adherent disinfectant, and then transferred to a measured volume of fresh sterile water and vigorously shaken to detach the organisms. A measured amount of the washings is plated and the number of colonies developing is counted. This method has sometimes been used by subsequent investigators (e.g., Madsen and Nyman, Firth and Macfadyen, Delépine). In 1897 Defries[19] also published a method of estimating germicidal power, which seems to present many advantages, but which appears to have been little employed. Small measured quantities of a broth culture are allowed to drop by means of a pipette on to the bottoms of small sterile test-tubes. The drops are allowed to dry in a film over the bottoms of the test-tubes, and the disinfectant solutions are then introduced and allowed to act for the requisite times, poured out, and the surplus washed away, and finally sterile broth is introduced in order to ascertain if growth occurs or no.

The most notable advance in the methods of testing disinfectants was the introduction of the Rideal-Walker[20] or drop method by Dr. S. Rideal and Mr. J. S. A. Walker in 1903. By this method the disinfectant to be tested is compared with carbolic acid or phenol and the solution of each which is germicidal in the same time on a standard organism is ascertained. The dilution of disinfectant divided by the dilution of phenol, which each thus accomplish the same "work" in the same time, is termed the carbolic acid coefficient. The standard organism usually employed is the typhoid bacillus in a young (24 hour) broth culture and the time is 15 minutes. For carrying out the test a special test-tube rack is very convenient. It has two tiers for test-tubes; the lower tier has five holes which hold three or four tubes containing solutions of decreasing strengths of the disinfectant to be tested, and two tubes or one tube containing standard carbolic acid solution of known strength for comparison. The upper tier has 30 holes in two rows, and spaced into six sets of five holes each. These hold tubes of sterile nutrient broth which are numbered from one to 30. The test is usually made with a broth culture of *Bacillus typhosus*, but other organisms may be employed. The process is as follows. The five tubes in the lower tier each contain three cubic centimetres of the disinfectant and carbolic solutions. Into each in succession, at intervals of half a minute, three drops of the typhoid culture are added with a pipette. Half a minute after the *last* tube has been inseminated a loopful is taken from the *first* tube and inseminated into the first broth tube, and this process is repeated at half-minute intervals until all the broth tubes have been inoculated. The inoculated broth tubes are then incubated at 37° C. for three days, and the occurrence or not of growth is taken as indicating the killing or non-killing of the organism respectively. Obviously the first set of five broth tubes inoculated are subcultures in which the organism has been acted upon by the disinfectant and carbolic solutions for two and a half minutes, the second set for five minutes, and so on. The results (taken from an actual test on a disinfectant "x") may be charted as follows (Table XIV.):—

TABLE XIV.—*Bacillus typhosus, 24 Hours' Broth Culture at 37° C., Room Temperature 60° F.*

Disinfectant.	Dilution.	Time culture exposed to action of disinfectant (in minutes).						Subcultures.	
		2½	5	7½	10	12½	15	Period of incubation.	Temperature.
"x"	1-1400	+	—	—	—	—	—	Three days.	37° C.
"x"	1-1500	+	+	—	—	—	—		
"x"	1-1600	+	+	+	—	—	—		
"x"	1-1700	+	+	+	+	—	—		
Phenol	1-100	+	+	+	—	—	—		

+ = growth in the subcultures. — = no growth in the subcultures.

From this it will be seen that the disinfectant "x" in a solution of 1 in 1600 kills in the same time (ten minutes) as carbolic 1 in 100. This result is expressed as a coefficient obtained by dividing the strength of disinfectant by the strength of carbolic which each kills in the same time: in the present instance the coefficient is $\frac{1600}{100} = 16{\cdot}0$, and this figure is known as the "carbolic acid coefficient."

In carrying out the test various standard conditions have to be adhered to. The culture has already been mentioned, the culture media should have a standard composition, the phenol must be accurately standardised by the bromine method, all pipettes and tubes must be sterile, and sterile distilled water used for making dilutions. The loop for subculturing should have an internal diameter of 3 mm. and may with advantage be bent at an angle so that the plane of the ring becomes parallel to the surface of the liquid when subculturing. Finally, growths in the subcultures should be obtained in those taken at not less than two—and preferably at three—of the time intervals from both the disinfectant and phenol solutions which correspond.[21]

As already mentioned, temperature influences the result, and the strength of phenol has to be varied for different room temperatures or a standard temperature of 20° C. (68° F.) may be adopted as suggested by Martin.

To meet the case of disinfectants which do not form a homogeneous solution or emulsion on dilution and tend to separate and precipitate on standing, whereby the upper

[12] Mittheilungen aus dem Kaiserlichen Gesundheitsamte, Band i., 1881, p. 234.
[13] Report on Disinfectants, American Public Health Association, 1888, p. 118 (also Manual of Bacteriology).
[14] Centralblatt für Bakteriologie, Band i., Abtheil 2, pp. 235 and 392.
[15] Loc. cit. and Deutsche Medicinische Wochenschrift, 1889, pp. 789 and 819.
[16] Loc. cit. [17] Loc. cit.
[18] Zeitschrift für Hygiene, Band vi., 1889, and Band ix., p. 395.
[19] Journal of the Sanitary Institute, vol. xviii., 1898, p. 416.
[20] Journal of the Royal Sanitary Institute, vol. xxiv., 1903, p. 424.
[21] See Hewlett, Manual of Bacteriology, third edition, 1908, p. 617.

layer of fluid loses some of its germicidal efficiency, Rideal and Walker[22] have suggested that a 1 per cent. solution of the disinfectant should be made in an ordinary one mark litre flask which is allowed to stand for 24 hours and then an amount pipetted off from the top of the fluid (avoiding floating matter) is used for making the further dilutions.

The drop method since its introduction has done more, perhaps, for raising the standard of disinfectants than anything else and the manner of carrying it out is delightfully ingenious. By its use a number of inefficient disinfectants have been shown up and to some extent eliminated. But the method is deficient in that no organic matter is introduced into the test, and thus a fictitious value may be given to disinfectants like potassium permanganate, hydrogen peroxide, and hypochlorites which act by oxidation, and even to some emulsified disinfectants, the efficiency of which may be reduced by organic matter. Moreover, in practical disinfection organic matter is always present and distilled water is never the solvent. On the other hand, the test is unduly severe on mercuric chloride, which after all is one of the best of ordinary germicides but which acts relatively slowly, and for which the time of exposure should be prolonged to from 20 to 30 minutes. As regards the incorporation of organic matter in the test, many suggestions have been made; for example, additions of gelatin, serum, and starch (Walker and Sommerville), of urine (Fowler), and of milk (Wynter Blyth) have been suggested. Dr. Martin of the Lister Institute suggests the use of 3 per cent. dried and ground up human fæces, which is perhaps as good as anything, but the ideal organic addition has yet to be found. Because of the relatively slower action of mercuric chloride and to make the test applicable to all classes of disinfectants Chick and Martin[23] suggest that the test should be performed in a standard time, 30 minutes being recommended as suitable, and the only variant being strength of disinfectant; not two variants, time and strength of disinfectant as in the "drop" method. It should be noted that this idea of adopting a standard time in which the germicidal action should be completed is not novel; it was suggested and adopted years ago by Sternberg and more recently by Defries, who says "it is convenient to determine the degree of concentration in which the disinfectant under examination will exercise disinfectant action within a *standard time*." For this "standard time" Sternberg suggested two hours, Defries ten minutes, and Martin first of all 15 minutes and finally, having regard to the slow action of mercuric chloride, 30 minutes.

Chick and Martin give the following details[24] for carrying out the test by this method. The fæces are dried first in a water bath and subsequently at 105° C., ground to a fine powder, and passed through a fine sieve with a mesh of 130 to the inch. Quantities of 0·15 gramme are weighed out and placed in test tubes. To each test tube 2·5 cubic centimetres of distilled water are added and the tubes are sterilised in the autoclave (10 minutes at 120° C.). The tubes are covered with indiarubber caps and kept in jars with greased lids to prevent evaporation. At the time of the experiment different amounts of a suitable dilution of the disinfectant are added to each tube, together with enough distilled water to make the total volume up to 5 cubic centimetres. The tubes then contain different concentrations of the disinfectant in question in the presence of 3 per cent. fæces. The tubes are inoculated and sampled in exactly the same way as when the test is made in distilled water. In the case of an unknown disinfectant one or two preliminary trials are necessary to ascertain a suitable range of concentration to give a useful result. The exact procedure may be made clearer by an actual example. Six tubes, each containing 0·15 grm. fæces in 2·5 cubic centimetres of distilled water, having been prepared, to each are added varying quantities of 2 per cent. disinfectant and water, as in Table XV., so arranged that the tubes contain 5·0 cubic centimetres of a series of concentrations of disinfectant in the presence of 3 per cent. fæces. In this experiment the approximate concentration necessary to disinfect in 15 minutes has been determined previously, and the actual concentration required to disinfect in the time is found to be between 4·0 and 4·6 parts per 1000. An exactly similar experiment with pure phenol is simultaneously made, so that the carbolic acid coefficient of the disinfectant can be directly determined.

[22] THE LANCET, Sept. 19th, 1908, p. 902.
[23] Journal of Hygiene, vol. viii., No. 5, 1908, p. 654.
[24] Loc. cit., p. 693.

TABLE XV.—*Fæces 3 per cent. and a Constant Number of Bacillus Typhosus per Cubic Centimetre.*

No. of c.c. of 2% disinfectant.	No. of c.c. distilled water added.	Total volume added, c.c.	Concentration of disinfectant in the tube, parts per 1000.	Results of experiment. + = acid formation in test cultures in glucose broth.	
0·9	1·6	2·5	3·6	+	+
1·0	1·5	2·5	4·0	+	+
1·15	1·35	2·5	4·6	—	—
1·3	1·2	2·5	5·2	—	—
1·5	1·0	2·5	6·0	—	—
1·7	0·8	2·5	6·8	—	—

Three per cent. of fæces, which forms the amount of organic matter in this test, was adopted because it represents the amount of solid matter present if a liquid stool (containing 10 per cent. of solids) were mixed with twice its volume of the disinfectant.

It appears to me that one more direction is required in this test. In practical disinfection the disinfectant, the organic matter in the material to be disinfected, and the organisms in that material come in contact with one another approximately at the same time. It would therefore be unfair to some disinfectants, the germicidal value of which might be rapidly depreciated by the organic matter, if an appreciable time elapsed between the making of the mixtures of disinfectant and fæces and the inseminating with the culture. I think that as the test is done at 20° C. the various constituents should be warmed to this temperature, mixed, and the culture added immediately; or better still, the tubes containing the suspensions of fæces with the requisite amounts of distilled water and of the culture might have the disinfectant added to them, the time being taken as that at which the disinfectant has been added.

Objection has been raised to the use of fæces (by Sommerville and Walker and Wynter Blyth) on the ground that fæces are of very inconstant composition. Chick and Martin have met this objection first by using the mixed fæces of several individuals for making the dried fæces employed in the test, and secondly by showing that with 15 different specimens of fæces the variation in the results is not greater than that which occurs using one specimen of fæces in determinations done on different days. Sommerville and Walker[25] have suggested as organic matter to be used in the test the addition of rice starch and gelatin. They recommend that the diluent consist of water containing 1 per cent. of organic matter consisting of 0·5 per cent. of gelatin and 0·5 per cent. of rice starch and sterilised. In this way organic matter, both in solution and in suspension, is added. Sommerville and Walker give the following carbolic coefficients obtained by this method. (Table XVI.)

TABLE XVI.

Disinfectant.	Diluent water.	Diluent gelatin + starch mixture.
A.	16·4	14·5
	16·5	14·5
	16·5	14·6
B.	10·0	7·0
	10·0	7·0
	10·4	7·0
C.	12·2	0·3
	12·0	0·3
	12·0	0·3

Presumably A and B were emulsified disinfectants, C probably a disinfectant acting by oxidation. I think that this method with gelatin and starch is worthy of further trial. If on the whole it be found as satisfactory as fæces

[25] Sanitary Record, March 26th, 1908.

has the advantage of employing a medium more readily prepared and of more constant composition than the fæces mixture.

To sum up. The Rideal-Walker or drop method is one which has given an enormous impetus to the standardisation of disinfectants and it is relatively simple to carry out—a very desirable condition. With the emulsified disinfectants it works well, but with disinfectants like mercuric chloride, which act comparatively slowly, it gives too low a value according to Chick and Martin. It is lacking in that in its original form it does not introduce organic matter into the test, a matter of considerable importance. This, however, may be remedied by the addition of fæces, or perhaps better still of gelatin and starch. In some instances the use of a 1 per cent. solution which has stood for 24 hours for making the test dilutions is desirable.

On the other hand, the Chick-Martin or Lister Institute method is applicable apparently to all classes of disinfectants and has the advantage that but a single variant (that of concentration of disinfectant) is present and not two variants—concentration and time—as in the Rideal-Walker or drop method. The method, however, is not nearly so simple to carry out as the Rideal-Walker one. The introduction of organic matter in the form of fæces marks a step in the right direction, but further work alone can prove whether this is the best material to employ. Chick and Martin themselves admit this and say:—

> We are not particularly enamoured of the method of testing a disinfectant in the presence of 3 per cent. dried fæces. In many respects it departs from the ideal, but by its means the germicidal value of a disinfectant can be approximately measured under conditions such as it may not unlikely encounter in practice. We realise that disinfectants are usually employed in a very casual way and quite as commonly as deodorisers as with a view to the sterilisation of the germs of disease. But there are times when the medical man or sanitarian wants to know what reliance he can place upon this or that disinfectant for a particular purpose, and we think that the determination of the value of a disinfectant made in the presence of 3 per cent. fæces will, for the majority of purposes, be more valuable than when made in distilled water.

Recently Schryver and Lessing[26] have published a procedure entitled "A Physico-chemical Method for Comparing the Antiseptic Value of Disinfectants." The principle of the method depends essentially upon the measurement of inhibition produced when varying quantities of an antiseptic are added to an infected medium, and comparing these quantities with the amounts of phenol or of any other standard germicide which produce the same result. The culture medium used is either a gelatin peptone or a sodium caseinogenate-peptone; this is inoculated with fæces and the changes occurring by the degradation of the protein constituent are determined by the change in the electrolytic conductivity of the mixture. The determination of electrolytic conductivity is simple, given the necessary apparatus, but is a very delicate matter, and the method, even if practicable, seems to be one for the determination of *antiseptic* value and not of true germicidal power.

[26] See Brit. Med. Jour., 1909, vol. 1., p. 103.

MEDICAL SOCIETY OF LONDON.—This society held its 136th anniversary dinner on March 10th, at the Whitehall Rooms, Hôtel Métropole, London, under the genial chairmanship of the President, Mr. C. B. Lockwood, who, in proposing the toast of "The Society," announced with evident satisfaction that "the position of the Medical Society of London is so sound financially, that if to-morrow they were obliged to liquidate, all the creditors could be fully paid at least eight times over." Mr. J. Langton, in submitting the toast of "The Guests and Kindred Societies," spoke of Sir William Church as "the presiding genius of the Cancer Research Fund," and Sir William Church, in replying to the toast, referred to the great traditions and the eminent position held by the society for more than a century. Sir Alfred H. Keogh, who also responded to the toast, paid an eloquent tribute to the medical profession for their services in regard to the medical service of the Territorial Forces. After Dr. J. Kingston Fowler had given the toast of "The President," that gentleman replied and concluded by thanking Mr. G. Bethell, the librarian, for his services and by proposing the health of the honorary secretaries, Mr. T. H. Kellock and Dr. Leonard E. Guthrie, who duly acknowledged the toast.

Hunterian Lecture

ON

X RAY CARCINOMA, AND AN EXPERIMENTAL INQUIRY INTO THE CONDITIONS WHICH PRECEDE ITS ONSET.

Delivered at the Royal College of Surgeons of England on March 17th, 1909,

BY CECIL W. ROWNTREE, M.B. LOND., F.R.C.S. ENG.,

HUNTERIAN PROFESSOR AT THE ROYAL COLLEGE OF SURGEONS OF ENGLAND, AND SURGICAL REGISTRAR AT THE MIDDLESEX HOSPITAL.

MR. PRESIDENT AND GENTLEMEN,—Shortly after the discovery of the x rays it was found that prolonged exposure to their influence might be followed by various ill-effects. These injuries may be divided into two classes: (1) more or less severe burns resulting from one considerable exposure; and (2) the results of constant exposure over prolonged periods to small doses of the rays, chiefly met with on the hands of physicians and manufacturers of x ray apparatus. These latter changes are summed up in the comprehensive term "x ray dermatitis," and it is with them that this lecture will be particularly concerned.

In 1903 attention was drawn to the startling fact that an ulcer indistinguishable from carcinoma had developed on the hand of an individual who was the subject of radiodermatitis, and it is now a well-established fact that in numerous instances this condition has resulted in the formation of a new growth, which in clinical and microscopic characters is squamous-cell carcinoma. So far as it has been possible to determine there have been in Great Britain 11 cases of x ray carcinoma, and of these it appears that one has proved fatal. By the courtesy of Dr. W. Bulloch, Mr. L. Dean, Mr. A. G. R. Foulerton, Mr. A. Pearce Gould, Dr. A. Grünbaum, Mr. J. Hall-Edwards, Mr. T. H. Kellock, and Mr. Walter Thompson it has been possible to obtain specimens from ten cases of carcinoma arising in x ray workers. No good purpose will be served by detailing the histories of all these cases, for in essence they are similar, and an abstract of one of them will illustrate what happens or what may happen in them all.

The case I would bring specially to your notice is of great interest, inasmuch as it affords a good illustration of what may happen in the absence of early surgical interference. When first operated upon the patient had been working with x rays for several years and had had severe dermatitis for two years. For 18 months he had had on the middle finger of the left hand a growth which involved practically the whole of the finger; it was irregularly lobulated, ulcerating, and very foul. The skin on the dorsum of the hand and remaining fingers was thin and atrophic and there were also numbers of pigmented warts. No enlarged lymphatic glands were detected and amputation was carried out through the proximal end of the metacarpal bone. This was in 1905 and for some time afterwards the condition of the hands remained more or less stationary, but severe dermatitis developed on the chin and on the front of the chest, the change in the latter situation being very definitely confined to the area represented by the opening of the waistcoat. Last month (February, 1909) this patient again presented himself for treatment, this time with a very extensive growth involving the second and third fingers of the other hand, while the first finger had completely sloughed off. There was also an extensive growth, apparently carcinomatous, on the chin. Amputation was carried out by Mr. Gould, the second and third fingers, with the corresponding metacarpal bones, being removed. Operation on the chin has not yet been undertaken.

Microscopic examination of the first growth showed small columns and islets of squamous cells separated by evident prickle spaces and showing very slight tendency to keratinisation. The cell masses were imbedded in a very well-marked connective tissue stroma in which the individual cells were particularly large and well developed. (Fig. 1.) The tissue

layer of fluid loses some of its germicidal efficiency, Rideal and Walker[22] have suggested that a 1 per cent. solution of the disinfectant should be made in an ordinary one mark litre flask which is allowed to stand for 24 hours and then an amount pipetted off from the top of the fluid (avoiding floating matter) is used for making the further dilutions.

The drop method since its introduction has done more, perhaps, for raising the standard of disinfectants than anything else and the manner of carrying it out is delightfully ingenious. By its use a number of inefficient disinfectants have been shown up and to some extent eliminated. But the method is deficient in that no organic matter is introduced into the test, and thus a fictitious value may be given to disinfectants like potassium permanganate, hydrogen peroxide, and hypochlorites which act by oxidation, and even to some emulsified disinfectants, the efficiency of which may be reduced by organic matter. Moreover, in practical disinfection organic matter is always present and distilled water is never the solvent. On the other hand, the test is unduly severe on mercuric chloride, which after all is one of the best of ordinary germicides but which acts relatively slowly, and for which the time of exposure should be prolonged to from 20 to 30 minutes. As regards the incorporation of organic matter in the test, many suggestions have been made; for example, additions of gelatin, serum, and starch (Walker and Sommerville), of urine (Fowler), and of milk (Wynter Blyth) have been suggested. Dr. Martin of the Lister Institute suggests the use of 3 per cent. dried and ground up human fæces, which is perhaps as good as anything, but the ideal organic addition has yet to be found. Because of the relatively slower action of mercuric chloride and to make the test applicable to all classes of disinfectants Chick and Martin[23] suggest that the test should be performed in a standard time, 30 minutes being recommended as suitable, and the only variant being strength of disinfectant; not two variants, time and strength of disinfectant as in the "drop" method. It should be noted that this idea of adopting a standard time in which the germicidal action should be completed is not novel; it was suggested and adopted years ago by Sternberg and more recently by Defries, who says "it is convenient to determine the degree of concentration in which the disinfectant under examination will exercise disinfectant action within a *standard time*." For this "standard time" Sternberg suggested two hours, Defries ten minutes, and Martin first of all 15 minutes and finally, having regard to the slow action of mercuric chloride, 30 minutes.

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it has the advantage of employing a medium more readily prepared and of more constant composition than the fæces mixture.

To sum up. The Rideal-Walker or drop method is one which has given an enormous impetus to the standardisation of disinfectants and it is relatively simple to carry out—a very desirable condition. With the emulsified disinfectants it works well, but with disinfectants like mercuric chloride, which act comparatively slowly, it gives too low a value according to Chick and Martin. It is lacking in that in its original form it does not introduce organic matter into the test, a matter of considerable importance. This, however, may be remedied by the addition of fæces, or perhaps better still of gelatin and starch. In some instances the use of a 1 per cent. solution which has stood for 24 hours for making the test dilutions is desirable.

On the other hand, the Chick-Martin or Lister Institute method is applicable apparently to all classes of disinfectants and has the advantage that but a single variant (that of concentration of disinfectant) is present and not two variants—concentration and time—as in the Rideal-Walker or drop method. The method, however, is not nearly so simple to carry out as the Rideal-Walker one. The introduction of organic matter in the form of fæces marks a step in the right direction, but further work alone can prove whether this is the best material to employ. Chick and Martin themselves admit this and say:—

> We are not particularly enamoured of the method of testing a disinfectant in the presence of 3 per cent. dried fæces. In many respects it departs from the ideal, but by its means the germicidal value of a disinfectant can be approximately measured under conditions such as it may not unlikely encounter in practice. We realise that disinfectants are usually employed in a very casual way and quite as commonly as deodorisers as with a view to the sterilisation of the germs of disease. But there are times when the medical man or sanitarian wants to know what reliance he can place upon this or that disinfectant for a particular purpose, and we think that the determination of the value of a disinfectant made in the presence of 3 per cent. fæces will, for the majority of purposes, be more valuable than when made in distilled water.

Recently Schryver and Lessing[26] have published a procedure entitled "A Physico-chemical Method for Comparing the Antiseptic Value of Disinfectants." The principle of the method depends essentially upon the measurement of inhibition produced when varying quantities of an antiseptic are added to an infected medium, and comparing these quantities with the amounts of phenol or of any other standard germicide which produce the same result. The culture medium used is either a gelatin peptone or a sodium caseinogenate-peptone; this is inoculated with fæces and the changes occurring by the degradation of the protein constituent are determined by the change in the electrolytic conductivity of the mixture. The determination of electrolytic conductivity is simple, given the necessary apparatus, but is a very delicate matter, and the method, even if practicable, seems to be one for the determination of *antiseptic* value and not of true germicidal power.

[26] See Brit. Med. Jour., 1909, vol. i., p. 103.

MEDICAL SOCIETY OF LONDON.—This society held its 136th anniversary dinner on March 10th, at the Whitehall Rooms, Hôtel Métropole, London, under the genial chairmanship of the President, Mr. C. B. Lockwood, who, in proposing the toast of "The Society," announced with evident satisfaction that "the position of the Medical Society of London is so sound financially, that if to-morrow they were obliged to liquidate, all the creditors could be fully paid at least eight times over." Mr. J. Langton, in submitting the toast of "The Guests and Kindred Societies," spoke of Sir William Church as "the presiding genius of the Cancer Research Fund," and Sir William Church, in replying to the toast, referred to the great traditions and the eminent position held by the society for more than a century. Sir Alfred H. Keogh, who also responded to the toast, paid an eloquent tribute to the medical profession for their services in regard to the medical service of the Territorial Forces. After Dr. J. Kingston Fowler had given the toast of "The President," that gentleman replied and concluded by thanking Mr. G. Bethell, the librarian, for his services and by proposing the health of the honorary secretaries, Mr. T. H. Kellock and Dr. Leonard E. Guthrie, who duly acknowledged the toast.

Hunterian Lecture

ON

X RAY CARCINOMA, AND AN EXPERIMENTAL INQUIRY INTO THE CONDITIONS WHICH PRECEDE ITS ONSET.

Delivered at the Royal College of Surgeons of England on March 17th, 1909,

BY CECIL W. ROWNTREE, M.B. LOND., F.R.C.S. ENG.,

HUNTERIAN PROFESSOR AT THE ROYAL COLLEGE OF SURGEONS OF ENGLAND, AND SURGICAL REGISTRAR AT THE MIDDLESEX HOSPITAL.

MR. PRESIDENT AND GENTLEMEN,—Shortly after the discovery of the x rays it was found that prolonged exposure to their influence might be followed by various ill-effects. These injuries may be divided into two classes: (1) more or less severe burns resulting from one considerable exposure; and (2) the results of constant exposure over prolonged periods to small doses of the rays, chiefly met with on the hands of physicians and manufacturers of x ray apparatus. These latter changes are summed up in the comprehensive term "x ray dermatitis," and it is with them that this lecture will be particularly concerned.

In 1903 attention was drawn to the startling fact that an ulcer indistinguishable from carcinoma had developed on the hand of an individual who was the subject of radiodermatitis, and it is now a well-established fact that in numerous instances this condition has resulted in the formation of a new growth, which in clinical and microscopic characters is squamous-cell carcinoma. So far as it has been possible to determine there have been in Great Britain 11 cases of x ray carcinoma, and of these it appears that one has proved fatal. By the courtesy of Dr. W. Bulloch, Mr. L. Dean, Mr. A. G. R. Foulerton, Mr. A. Pearce Gould, Dr. A. Grünbaum, Mr. J. Hall-Edwards, Mr. T. H. Kellock, and Mr. Walter Thompson it has been possible to obtain specimens from ten cases of carcinoma arising in x ray workers. No good purpose will be served by detailing the histories of all these cases, for in essence they are similar, and an abstract of one of them will illustrate what happens or what may happen in them all.

The case I would bring specially to your notice is of great interest, inasmuch as it affords a good illustration of what may happen in the absence of early surgical interference. When first operated upon the patient had been working with x rays for several years and had had severe dermatitis for two years. For 18 months he had had on the middle finger of the left hand a growth which involved practically the whole of the finger; it was irregularly lobulated, ulcerating, and very foul. The skin on the dorsum of the hand and remaining fingers was thin and atrophic and there were also numbers of pigmented warts. No enlarged lymphatic glands were detected and amputation was carried out through the proximal end of the metacarpal bone. This was in 1905 and for some time afterwards the condition of the hands remained more or less stationary, but severe dermatitis developed on the chin and on the front of the chest, the change in the latter situation being very definitely confined to the area represented by the opening of the waistcoat. Last month (February, 1909) this patient again presented himself for treatment, this time with a very extensive growth involving the second and third fingers of the other hand, while the first finger had completely sloughed off. There was also an extensive growth, apparently carcinomatous, on the chin. Amputation was carried out by Mr. Gould, the second and third fingers, with the corresponding metacarpal bones, being removed. Operation on the chin has not yet been undertaken.

Microscopic examination of the first growth showed small columns and islets of squamous cells separated by evident prickle spaces and showing very slight tendency to keratinisation. The cell masses were imbedded in a very well-marked connective tissue stroma in which the individual cells were particularly large and well developed. (Fig. 1.) The tissue

was not obtained sufficiently fresh to determine the exact nature of mitoses, which were present in considerable number. Some doubt has been expressed as to whether the growths in these cases are in reality carcinomata, and I would bring to your notice this section in which differential staining shows a growth which infiltrates surrounding structures and invades blood-vessels in the manner characteristic of malignant growths. The second growth in this case, which it will be remembered was on the other hand, possesses no character which enables one to differentiate it from any other form of squamous carcinoma.

FIG. 1.

The microscopical appearance of the growth in the first case.

The important clinical facts in the histories of the other cases are as follows. Sooner or later after commencing x ray work a severe burn—usually resulting in blistering of the hand—was contracted. The burn had the effect of indicating to the individual the serious dangers to be apprehended and in the majority of cases care was taken that no further considerable exposure was sustained. None the less, x ray work was continued and in course of time warts and the other changes of x ray dermatitis manifested themselves. In one case, however, it is certain that carcinoma resulted without a definite burn ever having taken place. Sooner or later one of the warts became larger and increasingly painful. Ultimately, a small ulcer formed at the base of the wart causing it to fall off, leaving a gradually extending ulcer which ultimately proved to be of malignant character. In three of the cases it has fortunately been possible to anticipate the ulcerating stage and to remove typical early carcinomata at a stage when the only evidence of new growth was a little thickening and infiltration at the base of a wart. Further points of interest are that two of the patients were only 30 years of age and all the others were under 50. And of considerable importance is the fact that in nearly half the cases the malignant growths were multiple—separate and distinct growths on both hands or several fingers.

It has long been widely believed that squamous carcinoma is intimately connected with chronic irritation. The real point for discussion is whether x ray dermatitis merely stands in the same relationship to new growth formation as other pre-cancerous conditions, or whether the x rays have some special action which disposes epithelium to malignant degeneration.

Concerning the very numerous conditions of chronic irritation which are closely associated with cancer—viz., chronic ulcers, scars—particularly the scars of burns—leucoplakia, paraffin eczema, Paget's eczema, lupus, chimney-sweeps' warts, &c., I would particularly draw your attention to two points. 1. The comparatively small percentage of cases in which carcinoma arises as a complication of these conditions. 2. The malignant growth in these cases is practically always single.

On the other hand, it is noteworthy that of 11 cases of x ray cancer no fewer than five had multiple lesions—separate and distinct carcinomatous growths either on different fingers or on different hands. In the first case, as already mentioned, there was a growth on each hand and one on the chin. And, again, the proportion of cases of x ray dermatitis in which carcinoma has developed is very considerable.

It would appear that these facts establish an important point of difference between x ray cancer and other forms of malignant growths. With x ray cancer may be considered another condition which is characterised by multiple epithelial growths. I refer to xerodermia pigmentosum. Very early in the history of x ray dermatitis it was recognised that it in many ways resembles xerodermia pigmentosum. In this disease grave pathological changes arise in the skin, apparently as the direct outcome of the exposure of, presumably specially disposed, individuals to the action of ordinary sunlight. The condition—which usually begins in infancy—is characterised in its earliest stages by the appearance of abundant freckles on those parts usually exposed to the light. A striking augmentation in the number and depth of pigmentations occurs with each succeeding summer until they are of large size and nearly black in colour. Subsequent changes are of two kinds, one or both of which may be found in any given case. First, small rounded areas of skin undergo atrophic change, leaving depressed avascular cicatrices. Secondly, localised overgrowths of epithelium may occur, resulting in the formation of warty masses which in certain cases have become carcinomatous. In a hitherto unpublished case, the notes of which Dr. J. J. Pringle kindly placed at my disposal, freckling was noticed at two years of age and the condition became gradually worse and worse; scarring of small isolated patches of skin occurring, particularly on the lower eyelids, with the result that ectropion and troublesome conjunctivitis followed. Finally, a brown warty growth appeared on the side of the nose. The resemblance to x ray dermatitis is rendered still more striking by the fact that numerous cases of xerodermia pigmentosum are recorded in which actual carcinomata have supervened and at an age when squamous-cell carcinoma is practically unknown under other circumstances. Thus Gaszman reports a case in a boy at the age of eight. X ray dermatitis and xerodermia pigmentosum, considered as conditions which dispose to the formation of carcinoma, would appear, therefore, to have much in common and to be differentiated from all other states which precede cancer.

In reference to the treatment of x ray cancer there is little doubt that the growths, though histologically they are squamous-cell carcinoma, are in the majority of cases of a low degree of malignancy. It is possible therefore, indeed it is probable, that instead of resorting to amputation of the finger or of the hand simple excision of the growth might safely be carried out. Among the cases I bring before you, in spite of extensive primary growths, in no instance has there been invasion of the lymphatic glands up to the present time. This fact suggests that where a wart or an ulcer has resisted treatment it should be freely excised without delay, and that even though histological examination may reveal the presence of carcinoma no further operative measure need be undertaken. This limited excision, however, is probably not indicated in cases where an ulcer has attained the macroscopic appearances of ordinary carcinoma. The malignant or non-malignant character of many quite considerable ulcers can only be determined microscopically. An ulcer may appear quite superficial and simple in character to the naked eye and yet under the microscope may reveal an extensively infiltrating carcinoma.

An experimental investigation of x ray dermatitis was carried out by exposing mice, rats, and rabbits to x rays for varying periods.[1] The experiments were subsequently modified in that a non-vital part of the body of the animal was alone subjected to the action of the rays, small leaden cages being made of such a shape as to inclose the head and body of a full-grown rat, leaving, however, the tail projecting from a hole in the end. By this means it was possible to subject the tails to long and frequent exposures without fatal results. Macroscopically, the first change is a slight swelling of the tail, followed by stiffness and a loss of

[1] These experiments were carried out by Dr. W. S. Lazarus-Barlow with another object, and he kindly placed the material at my disposal for histological purposes.

mobility. This is soon followed by redness, desquamation, and sometimes blistering or actual ulceration of that surface of the tail exposed to the rays. Towards the root of the tail this only occurred on the dorsal surface, but towards the tip, where, owing to its mobility, all surfaces received an approximately equal dose, the effects were more general. The under surface of the proximal portion of the tail did not, in the majority of cases, appear at all affected.

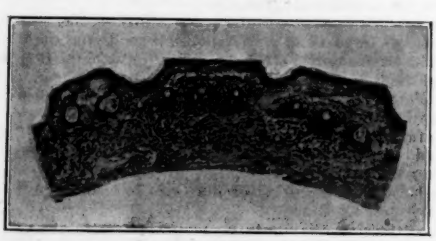
It will be convenient if a consideration of the minute changes in the epidermis be deferred until after various alterations in the connective tissues—met with both in the dermatitis of man and in that experimentally induced in animals—have been mentioned. The blood-vessels, the elastic tissue, the subepithelial connective tissues, and the bones all exhibit changes of importance. Degenerative changes in the blood-vessels have been referred to by numerous writers, many of whom agree in describing a thickening of the walls of the small vessels and a corresponding diminution in their lumen. Dilatation of the capillaries is a well-known feature of x ray dermatitis and radium burns. What precisely it is due to is not established, but it appears that it is not present in those cases of dermatitis in which there has been no acute burn. Many of the vessels in the subepithelial tissues in x ray dermatitis show considerable thickening of the walls.

The elastic tissue in the dermatitis of man and of animals gradually disappears, at first in a narrow zone under the epidermis but later in a patchy, irregular manner throughout the corium. This change in the elastic tissue is accompanied by changes in the other connective tissue of the corium, which becomes more cellular both as regards wandering and fixed cells, and ultimately passes into a condition in which it is not far removed from scar tissue, the wandering cells disappearing and leaving a homogeneous mass of connective tissue cells behind.

Changes in the bones have been noted in several cases of x ray dermatitis, both rarefaction and actual loss of substance occurring. The bones of the rats' tails in the above experiments showed similar but less advanced changes.

To consider now the results obtained in the animal experiments with regard to the epithelial elements of the skin. On examining the tails of the rats it was found that the sections of the skin showed three regions materially differing from one another. They were as follows: 1. The ventral surface showing practically no change (Fig. 2). 2. The dorsal

FIG. 2.



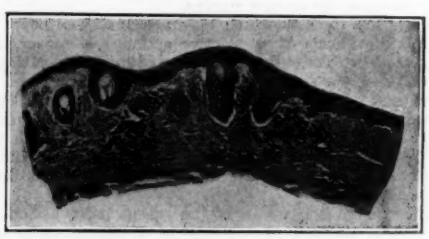
Microscopical appearance of ventral surface of rat's tail after exposure to the rays.

surface, where there was considerable change, largely of a destructive character (Fig. 3). 3. An intermediate region on each side of the tail, where the epidermis is hypertrophied (Fig. 4). A section of the ventral surface of one of these tails shows practically no departure from the normal. A section from the dorsal surface shows that the epidermis has undergone necrosis, is detached from the corium and infiltrated with leucocytes. The corium is remarkable for the disappearance of all traces of epidermal appendages. Hairs, hair follicles, sebaceous glands, and the small areas of fat with which the follicles are normally surrounded are absent and their place is taken by a very cellular connective tissue in which here and there are faintly staining foci which represent all that is left of these various structures. Here and there lightly staining dilated vessels are visible. In the intermediate zone the epidermis, instead of consisting of only five or six layers of cells, consists of 10 or 12 layers; and, moreover, this hypertrophic change is not confined to the epidermis, but is shown by the various epithelial appendages, the hair follicles forming large cellular masses which are very striking. From these experiments it appears that the x rays have two effects of which one is destructive, the other of a stimulating nature.

FIG. 3.

Microscopical appearance of dorsal surface of rat's tail after exposure to the rays.

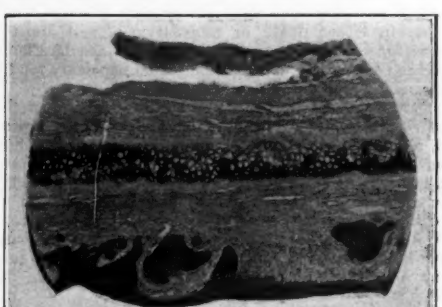
FIG. 4.



Microscopical appearance of "intermediate region" of rat's tail after exposure to the rays.

Still more striking are the results obtained by exposing the ears of rabbits to the rays. (Fig. 5.) On the exposed surface changes result which are comparable to those obtained in the rats' tails, but a rabbit's ear being thinner than a rat's tail, penetration occurs and the epidermis of the unexposed

FIG. 5.



Microscopical appearances of rabbit's ear after exposure to the rays.

surface of the ear undergoes a hypertrophic change comparable to that occurring in the lateral portions of the rats' tails, but even more considerable.

It may be considered that these epithelial changes prove nothing more than the influence of an irritant which, when

acting with great activity, produces necrotic changes, but when less intense has a stimulating effect such as all irritants are known to possess. But the x rays show a selective action and also influence nutrition long after they have ceased to act directly. Moreover, there is evidence that they possess a distinctly stimulating action that will be considered separately. The action of a single dose in producing epilation or even permanent baldness without any apparent change whatever in the overlying skin is convincing proof of selective action upon certain cells, and the fact that unless the dose has been excessive the hair grows again is proof that the action is not of a destructive, but rather of a retarding or atrophic nature.

In further support of this may be cited certain experiments carried out by Perthes, Abbe, and Danysz. Perthes exposed the ova of Ascaris megalocephala to the x rays for half an hour and found, not only that certain of them were killed outright, but that in others there was considerable delay in the process of development into embryos. Abbe took various samples of rape seed and exposed them to radium, one lot being exposed one day, another two days, and so on up to seven days. It was found that while 17 out of every 20 of the unexposed seeds grew and attained an average height of 7 inches, the number of exposed seeds which developed was in inverse proportion to the duration of the exposure, and further, that those which did grow did not reach so great a height as did the normal seeds. Danysz exposed mealworms to the action of radium. He found that while the control worms were passing through the ordinary cycle of life within their allotted period and becoming beetles, which laid eggs, which in their turn became mealworms, those which were irradiated and did not die lived on as mealworms for several months.

Similarly the sterility which may accompany exposure to the x rays is evidence of a selective action. Moreover, the effect is produced not only on fully formed spermatozoa themselves but upon the spermatogenic cells, for it is only two or three months after the last exposure to the x rays that motile spermatozoa are again formed. This strongly suggests that some change is brought about in the spermatogenic cells themselves which is not of a permanently destructive nature but rather of an atrophic or retarding character.

An interesting illustration of the retrogressive action of the x rays is afforded by the case of a patient under the treatment of Dr. J. H. Sequeira for radio-dermatitis in which wart formation was a prominent feature. A pastille dose of the x rays was given and five weeks later the areas which previously had been covered with warts were quite smooth. Similar improvement occurred in a case of xerodermia pigmentosum after x ray treatment.

At the Cancer Research Laboratory of the Middlesex Hospital Dr. Lazarus-Barlow[2] has carried out somewhat similar experiments to those of Perthes on the ova of Ascaris megalocephala, but samples of the ova were exposed to the rays for graduated periods. He has found that while an exposure of anything more than six or eight minutes results uniformly in either death or retardation of cell division, exposures for periods less than this result in acceleration of cell division and diminution of the period necessary for full development of the embryo.

Recently Dr. R. Cattley of Leeds kindly communicated to me the results he has obtained by exposing the growing root tips of plants to the x rays. He found that large doses have a retarding influence upon the growth of these vegetable cells; but he also found that limitation of the period of exposure leads to very definite stimulating action on cell division, the optimum effect being after a single exposure of about 30 minutes' duration. This increased activity is accompanied by an increase in mitotic figures and by a precocious splitting of the spiremes in the prophase.

It would therefore appear that the evidence is conclusive that the x rays in a moderately large dose cause retardation of cell division and tissue atrophy, but that in small doses the opposite effect of stimulating hyper-activity of cell proliferation is brought about.

The stimulating effect of the x rays does not appear to have received the attention which its importance merits. It is probable that to its existence we may attribute a large part of the epithelial overgrowth and wart formation present in x ray dermatitis. The very fact that x ray dermatitis is so sharply confined to the hands and that the wrists and arms escape suggests that constant small doses are the important factor, for the coat and shirt sleeves would be but slight protection against the action of large doses. And it is certain that the hands of workers with the x rays, unless the most extreme care be taken, are constantly exposed to those small doses, which it has been shown have a stimulating action upon epithelial tissues. But it is conceivable that something more than this may occur.

Probably there are two essential conditions for the formation of a squamous-cell carcinoma: (1) The presence of a mass of epithelial cells which are capable of multiplication, and (2) a surrounding area of connective tissue in such a special condition as to render it vulnerable to epithelial invasion. With regard to the second condition, it has already been shown that the connective tissues in advanced x ray dermatitis are in almost precisely the same condition as that shown by Dr. V. Bonney in this theatre last year invariably to obtain in pre-cancerous conditions. With regard to the first condition, it is a feature of x ray dermatitis that in certain stages the subepithelial tissue shows the presence of masses of epithelial cells which are more or less completely detached from the surface epithelium. It is not difficult to imagine that such a mass of cells lying isolated in a favourable stroma of altered connective tissue, may, as the result of the stimulating effects of constant small doses of the rays it is undoubtedly receiving, be excited to grow, and as there is no longer any normal purpose which this isolated mass of epithelium can fulfil it proliferates abnormally and invades the surrounding parts.

The practical application of what has gone before is of chief importance in connexion with the x ray treatment of malignant growths. There has been, and there still is, considerable divergence of opinion not only as to the kinds of growth which should be subjected to treatment but also as to the manner in which the best results may be obtained. All observers are agreed, however, that it is only in very superficial conditions that amelioration can be confidently anticipated.

Of all malignant growths rodent cancer is the most superficial and it is the only variety in which really good results have been obtained. But even in this condition the results are discordant, in some cases the tumour disappearing after two or three exposures, in other cases healing only to break down again or not healing at all.

It is possible that in certain cases the dose administered has been so large as to have induced a condition analogous to an x ray burn; or in other cases it is probable that a dose just sufficient to induce retrogression of the superficial parts of a growth may, in the deeper portions, stimulate to increased activity.

Any further points of practical importance which might be deduced from the observations I have had the honour of bringing before you I leave, Sir, in the hands of those whose large experience better fits them to deal with such a subject.

[2] The details of this research will be published shortly.

THE LONDON OPHTHALMIC EXHIBITION. — An exhibition of ophthalmic apparatus, instruments, drugs, &c., was held at the rooms of the Medical Society of London, 11, Chandos-street, on March 12th and 13th. All the chief ophthalmic instrument-makers and opticians were represented, including Messrs. Weiss and Son, Down Bros., H. F. Angus and Co., F. Davidson and Co., C. W. Dixey and Son, F. A. Hardy and Co., Hawes, Meyrowitz, and others. Messrs. Duncan, Flockhart, and Co. showed preparations of ophthalmic drugs. Amongst the novelties may be mentioned the newest forms of ophthalmometer, electric ophthalmoscope, and optometer, Hardy's stigmatometer for estimating refraction, Dixey's lens setting instrument and spectacle analyser, and the Sachs transilluminator. Mr. Arthur W. Head showed the originals of his beautiful coloured drawings of mammalian fundi. The exhibition undoubtedly serves a useful purpose in bringing together for the inspection of ophthalmic surgeons all the latest developments in instruments of various kinds. Judging by the interest displayed it proved a success and is likely to be repeated.

Three Hunterian Lectures

ON

THE MECHANISM UNDERLYING THE VARIOUS METHODS OF ARTIFICIAL RESPIRATION

PRACTISED SINCE THE FOUNDATION OF THE ROYAL HUMANE SOCIETY IN 1774.

Delivered in the Theatre of the Royal College of Surgeons of England on March 1st, 3rd, and 5th, 1909,

BY ARTHUR KEITH, M.D. ABERD., F.R.C.S. ENG.,

HUNTERIAN PROFESSOR AND CONSERVATOR OF MUSEUM, ROYAL COLLEGE OF SURGEONS OF ENGLAND.

LECTURE II.[1]—THE PERIOD OF MECHANICAL EXPANSION AND COMPRESSION OF THE CHEST WALL (1856–1909).

Delivered on March 3rd.

METHODS OF COMPRESSION EMPLOYED PRIOR TO 1856.

MR. PRESIDENT AND GENTLEMEN,—Although I have dated the commencement of this period with the introduction of Marshall Hall's method in 1856,[2] it must not be thought that artificial movements of the chest wall had not been intentionally practised before this date. In the report of the Humane Society for 1812 it is recommended, if bellows are not at hand, that the surgeon should practise alternate compression and relaxation of the abdomen rather than resort to the method of mouth-to-mouth inflation, because the exhaled breath was regarded then as poisonous. Astley Cooper recommended intermittent pressure of the chest and belly as the best means of resuscitation, a method he had seen (in his boyhood days, I suppose) employed by a surgeon in Yarmouth with great success. The first, however, to give his mind to the perfecting of this method was Leroy of Paris. In 1829 he saw that the bellows in the hands of ignorant operators might become a lethal weapon, and to replace them he proposed artificial respiration by a method similar to that introduced by Howard 42 years later. Leroy's method consisted in laying the patient face upwards and compressing the anterior wall of the abdomen and thorax, thus producing expiration, inspiration resulting from the elastic rebound of the chest wall. Semple, a surgeon of Islington, also practised this method—independently of Leroy. Dalrymple, on reviewing Leroy's method in the report of the Royal Humane Society of 1831, suggested, in place of Leroy's front-to-back compression of the thorax, a side to side compression either by the direct application of the hands or, better, by a wide (18 inches) many-tailed bandage placed round the patient's body. The drowned person was laid on his back and the bandage was passed beneath him, its ends being crossed in front of the chest. An operator on each side of the body constricted the thorax by pulling on the crossed ends, then relaxing their hold allowed a recoil and inspiration to occur. Dalrymple's bandage continued to be figured and recommended by the Royal Humane Society from 1833 until Silvester's method was introduced, but its use is seldom recorded.

MARSHALL HALL'S METHOD.

Mechanical movements of the chest wall as a means of producing artificial respiration were never seriously considered until they were advocated by Dr. Marshall Hall. In 1855, being then in his 65th year, he came across, on his return from a long holiday on the continent, the instructions issued by the Royal Humane Society for the resuscitation of the apparently drowned. He observed that all mention was omitted of artificial respiration, and he probably was well aware that the omission was owing to Sir Benjamin Brodie's influence. Impressed with the dangers of inflation by the bellows, a fear founded on the experiments of Leroy, he carried out a series of most ingenious experiments from which he concluded that the condition of drowning was one of anæsthesia and poisoning by a surcharge of carbon-dioxide. While experimenting on the dead human subjects at St. George's Hospital, assisted by Dr. Robert L. Bowles, Marshall Hall found—as Goodwyn had discovered 70 years before—when the patient was supine, that the tongue and larynx were apt to fall back and occlude the air passage. When the patient was placed in the prone position this difficulty was avoided. The ancient process of rolling the body as a method of resuscitation was well known to him. His reason for commencing with the body in the prone position was the result of experiments on the dead body. Compression of the chest which failed to produce artificial respiration when the body was in the supine position succeeded when it was turned face downwards. (Figs. 1 and 2.) He named his method the "ready" or "postural"

FIG. 1.

Marshall Hall's method. Inspiratory phase.

FIG. 2.

Marshall Hall's method. Expiratory phase.
(From the "Instructions" issued by the National Lifeboat Institution.

method; he produced expiration by (1) turning the patient in the prone (face down) position; and (2) by applying pressure to the back—over the thorax and abdomen. Inspiration commenced the moment this pressure was withdrawn and was completed by rolling the patient on to his side. The manner in which the body is turned over is important; the operator placed one hand *under the shoulder* and another under the hip. When the shoulder is thus lifted every muscle passing to the sternal and lateral aspect of the chest becomes taut and tends to expand the thorax. The two most essential features of Marshall Hall's method are often forgotten[3]—the expiratory compression of the thorax and the inspiratory traction of the shoulder muscles. The gaseous exchange effected by this method in the dead body was determined by the first Resuscitation Committee of the Royal Medical and Chirurgical Society in 1862 and was found to vary from 70 to 240 cubic centimetres. Within a year from the date of the publication of his method—that is, in 1857, the year in which he died—Marshall Hall was able to announce 23 cases of successful recovery from drowning by the employment of his method and one fatal case in which his method was not applied, besides three recoveries from chloroform syncope. It is worthy of note that everyone in the long train of inventors which followed in Marshall Hall's footsteps was also speedily in a position to show a long and impressive list of successes.

THE MECHANISM OF RESPIRATION IN DR. MARSHALL HALL'S METHOD.

Since the principles underlying the Marshall Hall method are those involved in the greater number of methods of artificial respiration it is important to examine them now somewhat closely. The possibility of carrying on artificial respiration

[1] Lecture I. was published in THE LANCET of March 13th, 1909, p. 745.
[2] Marshall Hall: Prone and Postural Respiration in Drowning, London, 1857 (edited by his son).
[3] In the official instructions issued by the National Lifeboat Institution instructions are confined merely to turning the patient over.

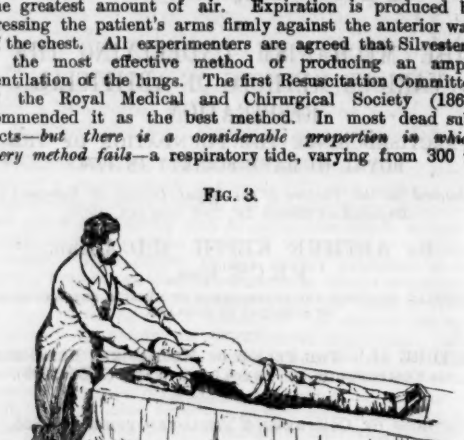
by a process of compression depends on the resiliency of the thoracic walls—on their tendency to resume their natural position when pressure is withdrawn. This property depends on: (1) the tension of the ligaments which bind the ribs to the vertebral column and limit the extent of the costal movement—when the ribs are depressed beyond their functional extent (under 45° to the spinal column) a strain is thrown on these ligaments; (2) the bending of the ribs and especially of their cartilages; (3) the stretching of all the muscles which are attached to ribs; and (4) the compression of the liver, the heart, the lungs, the spleen, and intestines, which in asphyxiated persons may be regarded as sacs filled with semi-fluid contents. When the compressing force is withdrawn the strain on all these parts is *gradually* undone by their return to a state of rest. During the rebound the lungs are more or less distended.

I carried out observations on a series of dead and living bodies to discover how far the resiliency of the thorax was altered by turning the body on its face.[4] Five bodies were employed, varying in age from 40 to 70 years; they were subjects from which rigor mortis had passed off. On turning the bodies from the supine to the prone position I found the back-to-front diameter of the chest to diminish 21·4 millimetres, while the side-to-side diameter increased 13·5 millimetres, the capacity of the chest, as shown by the escape of air, amounting to a little over 60 cubic centimetres. When a weight equal to 28 pounds was placed on the chest of the supine body the front-to-back diameter decreased 29·6 millimetres; when placed on the prone body the decrease was only 4·6 millimetres. Further, the recoil is slower in the prone position than in the supine; after applying pressure to a body in the prone position five minutes elapsed before the front-to-back diameter attained to within 5 millimetres of its original measurement, whereas in the supine position it reached within 2 millimetres of its original extent in one-third of a minute. Intermittent pressure applied at the rate of 15 times per minute quickly diminished the capacity of the chest in the dead, for each subsequent pressure is applied at an earlier stage of the rebound. It was undoubtedly to avoid this effect that Marshall Hall proposed to alternate pressure in the prone position with a lateral turning movement. In the prone posture the capacity of the chest and both the extent and rapidity of its resiliency are diminished. The essential acts in the Marshall Hall method are: (1) the expiratory pressure applied to the back when the body is prone; and (2) the inspiratory traction exercised on chest wall on turning the body over by lifting the shoulder.

THE MECHANISM UNDERLYING SILVESTER'S METHOD.

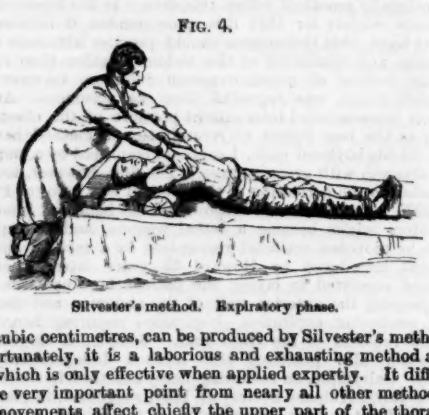
When the merits of Marshall Hall's method were being discussed by the Royal Humane Society, Silvester, a young practitioner in South London, introduced to its notice a method he had worked out on quite a new principle. The method was adopted by the society in 1861 and still remains its official method. The work of Silvester is of special interest to all connected with this College. He was one of the last of the student assistants paid and taught by the Council of this College to assist in the Museum when Owen was conservator. They were engaged by the College in the hope that when they went out into the world the Museum and its needs would be kept in mind. I have here the note-book in which Silvester kept a record of his original dissections. Soon after leaving the service of the College he published an account of his method of artificial respiration.[5] His aim was to imitate the natural respiratory movements. (Figs. 3 and 4.) He selected the supine posture, producing inspiration by expanding the chest wall and expiration by compressing it. His inspiratory movement is an example of applied anatomy. Traction was exercised on the anterior wall of the thorax through the great and small pectoral muscles. The operator stands at the patient's head and seizing the arms above the elbows lifts them towards the patient's chin, thus making the pectoral muscles taut. The tautness is much increased, as Champneys pointed out in 1887, if the arms be everted or rotated outwards as they are lifted. The arms are then carried back towards the patient's ears; the humerus and shoulder are thus used as levers and the anterior wall of the chest is raised upwards and forwards. The part of the lung expanded is chiefly that which lies under the sterno-chondral wall—the part which in drowning already contains the greatest amount of air. Expiration is produced by pressing the patient's arms firmly against the anterior wall of the chest. All experimenters are agreed that Silvester's is the most effective method of producing an ample ventilation of the lungs. The first Resuscitation Committee of the Royal Medical and Chirurgical Society (1862) commended it as the best method. In most dead subjects—*but there is a considerable proportion in which every method fails*—a respiratory tide, varying from 300 to

FIG. 3.



Silvester's method. Inspiratory phase.

FIG. 4.



Silvester's method. Expiratory phase.

500 cubic centimetres, can be produced by Silvester's method. Unfortunately, it is a laborious and exhausting method and one which is only effective when applied expertly. It differs in one very important point from nearly all other methods; the movements affect chiefly the upper part of the thorax; it is a thoracic form of artificial respiration, whereas nearly all the other methods give a movement of the abdominal type.

EXPERIMENTS OF BENJAMIN WARD RICHARDSON.

Although Ward Richardson[6] introduced no new method of artificial respiration, yet his inquiries (1865) into resuscitation of the apparently dead deserve our attention, for they are amongst the most important carried out in the nineteenth century. He found, as Benjamin Brodie and Erichsen had observed, that artificial respiration was powerless to resuscitate the heart if once its movements had ceased. He observed that inversion of the animal caused the surface of the lung to become again suffused with blood, but the pulmonary pressure thus raised was not sufficient to force blood through the lungs. He found that warm air or air laden with oxygen was more potent to resuscitate suspended animation than air at the ordinary temperature or of the usual composition. He was able to resuscitate the heart of a child which had been 12 hours dead by injecting its arteries with a fluid saturated with oxygen. He wished to convey such a solution to the heart of animals apparently dead by injecting it into the jugular vein with sufficient force to send it through the pulmonary circulation, but he found that the necessary force led to rupture of the pulmonary vessels. He then attempted to reach the heart through the arterial system and found

[4] London Hospital Gazette, June, 1908, p. 206.

[5] The True Physiological Method of Restoring Persons Apparently Drowned or Dead. London, first edition, 1858; third edition, 1863.

[6] Proceedings of the Royal Society, June 15th, 1865, p. 358.

that an oxygen-laden solution forced into the arteries with rhythmic strokes might reawaken the heart. In 1906 Crile and Dolley,[7] unaware of Richardson's researches, published a series of experiments showing that the heart could be resuscitated ten minutes after circulation had ceased by means similar to those proposed by Richardson. Two inferences drawn by Richardson from his experiments may be accepted as representing our present knowledge of the principles of resuscitation: (1) Resuscitation is possible by artificial respiration so long as there is a pulmonary circulation; and (2) it is also possible after circulation has ceased and before coagulation has commenced if the blood can be drawn or forced through the lung with sufficient pressure to enter the arteries of the heart.

METHODS OF PACINI AND BAIN.

In 1867 Pacini[8] of Florence introduced a method which, as regards the principle on which it is founded, is a modification of Silvester's. The supine posture is adopted and the patient's feet are fixed to the table so that the body may not move when the operator standing at the patient's head applies his strength. The manipulation carried out by the operator may be described as a "passive shrugging of the shoulder"; the shoulders are seized with the thumb in front of, and the fingers behind, the head of the humerus; as the operator pulls and lifts the shoulders towards the patient's ears the pectoral muscles passing to the front of the chest and the latissimus dorsi passing to its side become stretched and cause an inspiratory movement of the ribs—chiefly the upper. Expiration is caused by the recoil which follows relaxation of the shoulders. The Pacini method is also laborious and the passive expiratory recoil requires to be aided by active pressure to be really effective.

In the following year (1868) Dr. W. P. Bain on returning from Italy made Pacini's method known in England. He modified the manner in which Pacini grasped the shoulders so that the movements of the clavicle might be made more effective. He also introduced a method which is deserving of attention because it represents the effective part of one of the most ancient methods of resuscitation and one which I find from the records of the Royal Humane Society is still much in use—viz., that known as "agitation of the body." From 1774 onwards the Royal Humane Society had condemned agitation or manipulation of the body by the limbs. Bain observed that when he seized the hands of a dead subject—which lay on its back on the floor—and attempted to lift it by drawing the arms towards him an inspiratory movement occurred varying in amount from 80 to 300 cubic centimetres. He found that most effect was produced by standing at the head of the passive subject and then pulling and lifting the body by the hands towards him. The feet of the subject require to be held or fixed. The method is laborious and needs the application of pressure to the chest to make expiration effective. The second Resuscitation Committee was instituted to inquire into the merits of the Pacini-Bain method but it never really proceeded to work.

HOWARD'S METHOD.

In 1871 Dr. Benjamin Howard[9] of New York introduced another method of artificial respiration. In teaching the police of New York he found that the methods of Marshall Hall and of Silvester were too complicated to be clearly understood and readily applied by non-professional assistants. His aim was to discover a method which was at once simple and effective; as a preliminary measure the body of the patient is turned face downwards and is compressed to expel the water. The patient is then turned face up and artificial respiration applied. The principles underlying Howard's method are the same as were utilised by Leroy, Dalrymple, and Marshall Hall—viz., expiration by compression and inspiration by the recoil of the chest wall. (Figs. 5 and 6.) In order to secure as great a degree of recoil as possible, he produced over-extension of the spine by placing a pillow or any convenient support under the patient so as to make the subcostal margin prominent. The operator faces and kneels astride, or at the side of, the patient, placing a hand over each prominent subcostal margin so that the fingers occupy the furrows between the ribs above the margins and the palm below them. When pressure is applied by the operator placing his weight over his hands, expiration is produced by a triple movement: (1) the lower six, or diaphragmatic ribs are depressed; (2) the abdominal contents, especially the liver and spleen, engorged and distended with blood, are compressed so as to force upwards the diaphragm and empty the lungs; and (3) the extension of the spine is partly undone. The spinal movement is an important one. Whenever the pressure is withdrawn the spine again becomes over-extended and produces an inspiratory movement. The lower ribs again become prominent and the viscera slowly return to a position of rest. Inspiration is effected by the rebound.

FIG. 5.

Howard's method. Preliminary compression.

FIG. 6.

Howard's method. Posture of patient and of operators. (From Howard's original paper.)

Whereas Silvester's methods and all its modifications produce movements resembling the thoracic type of respiration, Howard's method gives one which is abdominal in type. It is alleged that rupture of the liver is apt to follow a too vigorous use of the Howard method. I have been unable to discover in post-mortem records any real ground for such rumours, but unfortunately our post-mortem records of cases of asphyxia are very deficient in both number and quality. Howard's method differs from Silvester's in its effect on the circulation. In cases of drowning, when the circulation has begun to fail, the right heart is distended; within the great engorged venous cistern formed by the great veins of the abdomen and the thorax the blood is locked in by valves situated above the clavicle and below Poupart's ligaments. The liver and spleen are distended with blood. Pressure applied as in the Howard method will force the blood through the pulmonary circulation. The late Mr. Harold Barnard informed me that in a case of death from chloroform he had been able, by performing Howard's method after death, almost to empty the great veins and right side of the heart, and to distend the left side of the heart and the arteries. But what is the effect of the application of such pressure on the right side of the heart? Will the increased distension of the right auricle and ventricle which follows from compression of the body favour an increased action of the heart already weakened from over-distension? This is a point which requires further experimental elucidation. In 1878, the third Resuscitation Committee reported that Howard's method had no advantage over Silvester's.

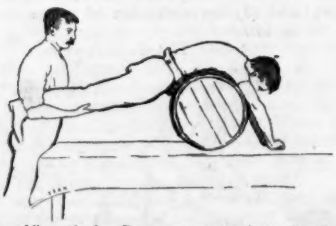
RESUSCITATION OF STILLBORN CHILDREN.

The Royal Humane Society has always taken a close interest in the resuscitation of stillborn children. In

[7] Journal of Experimental Medicine, 1906, vol. viii., p. 713.
[8] Bain, W. P.: Transactions of the Royal Medical and Chirurgical Society, Dec. 8th, 1868.
[9] The Direct Method of Artificial Respiration (Prize Essay), Transactions of the American Medical Association, 1871; THE LANCET, August 11th, 1877, p. 194.

1802 it presented its medal to Mrs. Ann Newby, matron of the City of London Lying-in Hospital, for 500 cases of successful resuscitation. Unfortunately, no mention is made of the method employed, but I have reason to believe that mouth-to-mouth inflation was

FIG. 7.



The "barrel" method. Commencement of the inspiratory phase. (To illustrate the ancient method mentioned in Lecture I.)

part of the means. In 1816 her successor, Mrs. Widgeon, had a similar honour conferred on her, and in 1857 Mrs. Mary Widgeon also received a medal. She employed the same means "as her late mother"—chiefly warmth and friction. In 1871, the same year as Howard introduced his method, Schultze[10] made known a very ingenious manner of performing

FIG. 8.

The "barrel" method. Expiratory phase.

artificial respiration on children. In principle the method is a modification of Pacini's. The operator stands up and suspends the child between his legs by a finger in each armpit. The legs hang down and the head is supported between the operator's hands. The child's body is thus suspended by the muscles passing from the shoulder to the thorax, the ribs pulled upwards and outwards and air drawn into the chest. An additional effect is produced: the abdominal viscera sink downwards, drawing with them the diaphragm and thus assisting to expand the lungs. Champneys found that the movement of the diaphragm was not of great consequence. The weak point of Schultze's method is the expiratory movement. The operator, standing with the child suspended between his legs, swings it forwards and upwards until the lower part of the child's body doubles upwards on to its chest; such a movement is not well designed to give an effective expiration.

SCHROEDER'S METHOD.

We are now dealing with that part of the nineteenth century when a rapid procession of new methods of artificial respiration appeared. In 1874 Schroeder[11] published a method for resuscitation of the newly born. Although the method is ineffective, the principle underlying it is interesting. The operator supports the child horizontally by placing one hand under its back; the spine is thus overextended, the head, arms, and legs hang downwards, thus producing expansion of the chest. The inspiratory movement is rendered ineffective by the fact that in the overextended position the abdominal viscera are pressed upwards against the lungs by the stretched abdominal musculature. Schroeder produced expiration by raising and flexing the suspended arms and legs against the body of the child. The method proposed by Mr. J. A. Francis[12] in 1886 for the resuscitation of adults is similar in principle to Schroeder's. The patient is laid on the ground, face upwards. By slipping a pole or other convenient means under the back the patient is raised or prized upwards until only the heels and head and hands are in contact with the ground. The over-extension of the spine and the weight of the arms and head, dependent from the thorax, produce an inspiratory movement; replacing the patient on the ground an expiratory one.

[10] Der Scheintod Neugeborener, p. 162, Jena, 1871.
[11] Lehrbuch der Geburtshülfe, p. 673, Bonn, 1874.
[12] Brit. Med. Jour., vol. i., 1886, p. 540.

SHÜCKING'S METHOD.

Adrian Shücking[13] of Halle, in 1877, proposed a method for stillborn children which is really a modification of Silvester's. The arms, instead of being raised and drawn towards the side of the head, as in Silvester's method, are abducted or drawn outwards from the side of the body, thus giving a lateral expansion of the thorax; expiration is produced by pressing the arms firmly against the sides of the chest and belly.

SCHÜLLER'S METHOD.

The method designed by Max Schüller[14] of Greifswald in 1879 was more especially designed for the resuscitation of cases of chloroform asphyxia. He made the usual claim that his method was "simpler, more practical, and more effective" than the methods then in use. Schüller reversed the movements used by Howard. He stood or knelt at the patient's head and bent over it to grasp the subcostal margins which are made prominent by placing a support under the patient's back; the operator inserts his fingers under the subcostal margins and then draws the ribs upwards and outwards in the direction of the patient's shoulders, thus producing inspiration. Schüller was of opinion that this movement flattened and depressed the diaphragm, thus helping to distend the lungs. Expiration is produced by pressing the lower ribs downwards and inwards to force the abdominal viscera and diaphragm upwards. He supported the efficacy of his method by experiments on the dead body and on the living.

The "Experimental Researches on Artificial Respiration on Still-born Children," published by Dr. F. H. Champneys[15] in 1887, remains the most authoritative statement of our knowledge on this subject. In a series of 21 bodies of children he was able, by inflating the lungs, to produce emphysema of the mediastinum in seven of them, the rupture occurring near the root of the lung, and pneumothorax in five. Rupture of the lung occurred at various degrees of intra-tracheal pressure ranging from 20 to 80 millimetres of mercury. As regards artificial respiration his final advice is: "Inflate by the mouth and then by Silvester's method. If air enters the lungs, well and good; if not, try Schultze's method." He modified Schultze's method by suspending the child by the hands instead of supporting it from the axillæ. This modification, which should be known as Champney's method, is not recommended by its author.

RECOMMENDATIONS OF DR. R. L. BOWLES.

Since 1856, when he assisted to carry out experiments for Marshall Hall, until the present day Dr. Bowles[16] has championed the claims of the prone or postural method. In his opinion it is a matter of the utmost importance that the water, as far as is possible, should be emptied from the lungs by placing the patient in the prone position. In performing Marshall Hall's method he secures a greater inspiratory expansion of the chest by abducting the free arm when the patient is in the lateral position. He also advocates maintaining the patient, when spontaneous respiration has returned, on one side, so that the upper, which is necessarily the active lung, may clear up by draining into the lower. He has proved by clinical means that the lung thus set free clears up first.

[13] Berliner Klinische Wochenschrift, Jan. 8th, 1877, p. 20.
[14] Ibid., June 2nd, 1879, p. 319.
[15] London, Lewis, 1887.
[16] THE LANCET, June 22nd, 1901, p. 1743 et seq.; Brit. Med. Jour., vol. i., 1864, p. 149; Transactions of the Royal Medical and Chirurgical Society, May 28th, 1889. "A Method for the Treatment of the Apparently Drowned": London, 1904.

DONATIONS AND BEQUESTS.—Under the will of the late Mr. Zunz the committee for the removal of King's College Hospital to South London has received a cheque for £2500 from the trustees, this being a second instalment of a grant of £10,000 promised to the fund on the condition that a ward in the new hospital, containing not less than 20 beds, is to be called the "Annie Zunz Ward."

AN INVESTIGATION INTO THE LEUCOCYTOSIS OF EPIDEMIC CEREBRO-SPINAL MENINGITIS.

BY WILLIAM DOW, M.D. GLASG.,
LATE SENIOR RESIDENT PHYSICIAN CITY OF GLASGOW FEVER HOSPITAL, BELVIDERE.

THE following observations on the leucocytosis of cerebro-spinal fever were made in the year 1906 during the first part of the recent epidemic. 55 verified cases were admitted into Belvidere Fever Hospital during that year, and in 36 of these observations into the leucocytosis were made. The blood was examined usually every third or fourth day between 10 and 11 A.M. throughout the whole course of the disease. Daily observations were sometimes made with a view of observing the relation of the leucocytosis to the pyrexia, while in chronic cases observations were often only made at weekly intervals. The red corpuscles were not counted, nor was the hæmoglobin estimated. The blood was usually taken without pressure from the lobe of the ear, but occasionally it was found more convenient to collect it from the finger. Films were prepared at the same time and fixed and differentiated by Leishman's modification of the Romanowsky stain.

In the course of the present investigation the leucocytosis was estimated 259 times, and in 171 of these the different forms of leucocytes were counted. The patients were of both sexes and at all stages of life. For the differentiation of the leucocytes 500 cells were counted on the average.

The cases have been classified in the following four groups, already described in a former clinical description,[1] of the disease:—(I.) the acute cases; (II.) the abortive cases; (III.) the mild cases; and (IV.) the chronic cases. The acute cases number 10; the abortive, two; the mild, three; and the chronic, 21. All those in the first and last classes, with the exception of three chronic cases, were fatal, while in Groups II. and III. all the patients recovered. Of the acute cases five were males and five were females, their ages ranging from one year to 24 years; the two abortive cases were males, their ages being nine years and 20 years respectively; of the mild cases, two patients were females and one was a male, their ages being 31, six, and five years respectively; while of the chronic cases, 11 patients were males and 10 were females of ages varying from four months to 16 years.

To save undue repetition in the text the results of some of the observations have been collected in the form of tables, but as these observations are so numerous only a few of the most typical ones are inserted in this paper. Ehrlich's nomenclature has been used as that most generally approved. The tables give the morning and evening temperatures of the cases observed and the total number of leucocytes recorded on each observation, along with the absolute numbers and percentages of each variety of white cell observed on each occasion. In those instances where the total leucocytosis alone is recorded, a differential count was not made.

The general results of the observations may be briefly outlined. If we take 7000 to 8000 leucocytes per cubic millimetre of peripheral blood as the standard, it will be observed that the number of the leucocytes was constantly in excess of this. In one of the mild cases, however, a single count of 2600 cells was obtained. This case, though the pyrexia lasted 50 days, is included among the mild cases, because there were never any of the severer symptoms present, nor was the patient's life ever considered in danger. In addition it should be noted that the leucocytosis was due, as a rule, to an increase, both absolute and relative, of the polymorphonuclear cells. In those cases where the patients were infants or young children a distinct lymphocytosis, both absolute and relative, was very occasionally observed. This was more marked in the chronic form of the disease. The leucocytosis in the cases recorded was generally considerable. It has in general risen and fallen with the temperature.

The particular results in each type of the disease now fall to be discussed. The acute cases will be described first.

[1] THE LANCET, March 14th, 1908, p. 768.

GROUP I.—*Acute Cases (Fatal).*

In the acute cases examined the patients were admitted between the third and sixth days of illness, and as all of them died within about from 24 to 48 hours after admission, only one observation was made except in one instance. In all these cases the leucocytosis was very considerable. The maximum number of white cells varied between 18,000 and 66,800, the latter being the highest individual count in any of the groups. The leucocytosis was always due to an increase, both absolute and relative, of the polymorphonuclear cells.

Even in infancy the leucocytosis is polymorphonuclear. In the case of a child (Case 4) aged only 16 months the percentage of polymorphonuclear cells was 88·75 and of lymphocytes 10·25, which is evidence of a very great increase. In the case of another child of the same age (Case 3) the percentage of polymorphonuclear cells was 54·4 and of lymphocytes 40, which is almost an exact interchange of the normal proportions and still shows a considerable increase.

The large mononuclear cells retained their normal relative proportions in four of the cases, and in the other six their relative percentage was very much reduced. In one instance (Case 6), in which the differential count showed 94·3 per cent. of polymorphonuclear cells, no large mononuclear cells were observed in the film examined. This diminution was absolute as well as relative in two of the cases (Cases 2 and 6).

Eosinophile corpuscles were not observed in the films examined of any of this series of cases. This is what one would expect to find, as these cells are recognised to be rare in cases of septic disease which are fatal. Complete absence of these corpuscles is found in typhus and pneumonia and plague, &c., and is observed apparently only in cases which eventually terminate unfavourably. As the acute form of cerebro-spinal meningitis was always fatal, it is noteworthy that eosinophile corpuscles were found absent in all of this group, although they were found in varying amounts in all the other forms of this disease.

GROUP I.—*Acute Cases.*

CASE 1.—The patient, aged 15 years, who was admitted to hospital on the fifth day of illness, died on the seventh day of illness.

Observations made on the fifth day of illness.—Temperature: morning, 101° F.; evening, 101·8°. Leucocyte count: total number, 27,600—polymorphonuclear cells, 25,875; lymphocytes, 1173; large mononuclear cells, 552; eosinophile cells, *nil*. Differential count: polymorphonuclear cells, 93·75 per cent.; lymphocytes, 4·25 per cent.; large mononuclear cells, 2 per cent.

CASE 2.—The patient, aged five years, who was admitted to hospital on the sixth day of illness, died on the eighth day of illness.

Observations made on the eighth day of illness.—Temperature: morning, 103·2° F.; evening, 103·8°. Leucocyte count: total number, 20,200—polymorphonuclear cells, 17,675; lymphocytes, 2373; large mononuclear cells, 152; eosinophile cells, *nil*. Differential count: polymorphonuclear cells, 87·5 per cent.; lymphocytes, 11·75 per cent.; large mononuclear cells, 0·75 per cent.

CASE 3.—The patient, aged one year and four months, who was admitted to hospital on the fourth day of illness, died on the fifth day of illness.

Observations made on the fifth day of illness.—Temperature: morning, 101·8° F.; evening, 103·8°. Leucocyte count: total number, 20,000—polymorphonuclear cells, 10,880; lymphocytes, 8000; large mononuclear cells, 1120; eosinophile cells, *nil*. Differential count: polymorphonuclear cells, 54·4 per cent.; lymphocytes, 40 per cent.; large mononuclear cells, 5 per cent.

CASE 4.—The patient, aged one year and four months, who was admitted to hospital on the fifth day of illness, died on the seventh day of illness.

Observations made on the sixth day of illness.—Temperature: morning, 99° F.; evening, 102°. Leucocyte count: total number, 23,400—polymorphonuclear cells, 20,768; lymphocytes, 2398; large mononuclear cells, 234; eosinophile cells, *nil*. Differential count: polymorphonuclear cells, 88·75 per cent.; lymphocytes, 10·25 per cent.; large mononuclear cells, 1 per cent.

CASE 5.—The patient, aged six years, who was admitted to hospital on the third day of illness, died on the fourth day of illness.

Observations made respectively on the third and fourth days of illness.—Temperature: morning, 101·8° F. and 98·4°; evening, 99·6° and 98·4°. Leucocyte counts: total number, 55,000 and 66,800—polymorphonuclear cells, 45,513 and 55,277; lymphocytes, 8525 and 9352; large mononuclear cells, 962 and 2171; eosinophile cells, *nil*. Differential counts: polymorphonuclear cells, 82·75 per cent. each day; lymphocytes, 15·5 and 14·0 per cent.; large mononuclear cells, 1·75 and 3·25 per cent.

CASE 6.—The patient, aged 13 years, who was admitted to hospital on the third day of illness, died on the fifth day of illness.

Observations made on the fourth day of illness.—Temperature: morning, 101·2° F.; evening, 101°. Leucocyte count: total number, 35,000—polymorphonuclear cells, 33,006; lymphocytes, 1995; large mononuclear cells, *nil*; eosinophile cells, *nil*. Differential count: polymorphonuclear cells, 94·3 per cent.; lymphocytes, 5·7 per cent.

GROUP II.—*Abortive Cases (Recoveries).*

This group comprised two cases, in both of which the leucocyte counts were taken after the temperature had

become normal. In the one case (Case 11) the patient was admitted on the eleventh day of illness, and there had been no pyrexia from the time of admission onwards. In the other case (Case 12) the patient was admitted on the fourth day of illness, and the leucocytosis was obtained from the sixteenth to the twenty-seventh days of illness, although there had been an absence of pyrexia from the seventh day onwards unless for a temporary rise of temperature on the fifteenth day. Both patients, however, were still complaining of pains in the head and the back for several days after the disappearance of the pyrexia. In the former case (Case 11, patient aged 20 years) the estimate varied between 10,000 and 14,000. The relative percentage of the polymorphonuclear cells remained practically the same as in normal blood, but the relative percentage of lymphocytes was slightly increased at the expense of the large mononuclear cells, which were both absolutely and relatively diminished. In the latter case (Case 12, patient aged nine years) the estimate was from 14,000 to 23,400. Out of the four differential estimates made, the polymorphonuclear cells preserved the relative percentages obtained in adult normal blood on the first and last occasions. In the other two observations, a relative and absolute lymphocytosis was present, which might be accounted for in part by the youth of the patient. The large mononuclear cells were relatively diminished. This change was absolute as well as relative in one instance, and on one occasion these cells were entirely absent. Eosinophile cells were present throughout in the former case (Case 11), but were not observed in the latter case (Case 12) till far on in convalescence.

GROUP II.—*Abortive Cases (Recoveries).*

CASE 11.—The patient, aged 20 years, was admitted to hospital on the eleventh day of illness.

Day of illness.	Temperature.		Total number of—					Percentages of—			
	Morning.	Evening.	Leucocytes.	Polymorphonuclear cells.	Lymphocytes.	Large mononuclear cells.	Eosinophile cells.	Polymorphonuclear cells.	Lymphocytes.	Large mononuclear cells.	Eosinophile cells.
	°	°						%	%	%	%
12	98	99	12,200	8510	3446	61	183	69·75	28·25	0·5	1·5
13	98	99	13,000	8715	4355	65	65	65·5	33·5	0·5	0·5
17	98	98·4	14,000	9800	3990	175	35	70·0	28·5	1·25	0·25
19	98	99	10,000	6050	3375	25	50	60·5	33·75	0·25	0·5

GROUP III.—*Mild Cases (Recoveries).*

This group comprised three cases, in which all the patients recovered. The temperature remitted from 101° to 103° F. to about normal in the morning throughout the whole course of the fever, which lasted about from 40 to 50 days. The differential estimate was done in the first two cases (Cases 13 and 14) throughout the whole period of pyrexia. In the third case (Case 15) only one leucocyte count was taken and no differential estimate was made, so that no value can be attached to this observation unless to show that a single count taken at random revealed a leucocytosis. The number of white cells during the pyrexia varied in the first case (Case 13) between 10,000 and 30,000; in the second case (Case 14) between 2600 and 16,200. The single count in the third case (Case 15) revealed 24,000 white cells. With the fall of the temperature the leucocyte counts became normal. The leucocytosis in this group of cases was not specially high. As in the chronic group, it increased and decreased in a very irregular manner from day to day, and this can only be explained by the variability in the temperature. To a certain extent the leucocytosis *has* risen and fallen with the temperature in these cases, but this was not a constant phenomenon, nor did the variation in the number of the leucocytes show any correspondence with any other clinical symptom. In the second case (Case 14) the leucocyte count remained low from the fourteenth day onwards to the fiftieth day, when the patient was quite well. This change occurred the day after the patient had a first injection of anti-meningococcic serum, so that there was practically an absence of leucocytosis from that date onwards while the patient was under observation. A hypo-leucocytosis is recorded after the injection of antitoxic serum in diphtheria, and as these low counts were quite exceptional in the ordinary course of the disease it may be presumed that they were due to the injection of anti-meningococcic serum.

In the first case (Case 13), that of a child, aged six years, the polymorphonuclear cells showed a relatively higher percentage than they normally should at that period of life. In a single differential estimate taken two days after the temperature had become normal, a relative and absolute increase of lymphocytes was obtained, and if we take this as approximating the normal percentage of the different forms of cells in this case then it might be reasonable to infer that the previous estimates revealed a polymorphonuclear leucocytosis. The large mononuclear cells were diminished both absolutely and relatively.

In the second case (Case 14), the relative percentage of the polymorphonuclear cells remained practically in the ratio observed in normal blood, unless on two occasions when the percentage was over 80. The relative percentage of lymphocytes was slightly increased at the expense of the large mononuclear cells, which were relatively and absolutely diminished, and on four occasions entirely absent.

Eosinophilic cells were present throughout in both cases. In the second case (Case 14) the proportion of these cells was as high as 5 per cent., but there was no real eosinophilia. This is interesting in view of the fact that in the acute cases, all of which were fatal, these cells were completely absent.

GROUP III.—*Mild Cases (Recoveries).*

CASE 14.—The patient, aged 31 years, was admitted to hospital on the fifth day of illness.

Day of illness.	Temperature.		Total number of—					Percentages of—			
	Morning.	Evening.	Leucocytes.	Polymorphonuclear cells.	Lymphocytes.	Large mononuclear cells.	Eosinophile cells.	Polymorphonuclear cells.	Lymphocytes.	Large mononuclear cells.	Eosinophile cells.
	°	°						%	%	%	%
5	—	102·4	11,600	9048	2494	29	29	78·0	21·5	0·25	0·25
8	98·2	102·6	13,400	9782	3350	201	67	73·0	25·0	1·5	0·5
9	100·2	101·2	12,000	—	—	—	—	—	—	—	—
10	101·8	103·8	16,200	—	—	—	—	—	—	—	—
11	98·4	104·0	14,000	—	—	—	—	—	—	—	—
14	100·4	103·8	12,200	9974	1983	152	91	81·75	16·25	1·25	0·75
17	98·0	103·8	9,000	6075	2700	—	225	67·5	30·0	—	2·5
19	99·4	102·4	7,000	4550	2310	—	140	65·0	33·0	—	2·0
20	98·4	102·4	7,200	5148	1872	—	180	71·5	26·0	—	2·5
21	98·4	99·8	7,600	5092	2052	76	380	67·0	27·0	1·0	5·0
23	99·6	100·8	4,600	3220	1150	—	230	70·0	25·0	—	5·0
25	99·6	102·4	6,000	4170	1605	30	195	69·5	26·75	0·5	3·25
29	102·2	99·8	11,600	—	—	—	—	—	—	—	—
33	100·2	101·2	2,600	—	—	—	—	—	—	—	—
37	99·2	100·4	7,600	—	—	—	—	—	—	—	—
39	97·0	102·0	9,400	6204	3032	23	141	66·0	32·25	0·25	1·5
44	97·4	99·6	10,400	8398	1794	208	—	80·75	17·25	0·2	—
50	98·8	98·8	6,800	4536	2142	102	—	67·0	31·5	1·5	—

GROUP IV.—*Chronic Cases (21 Cases; Three Recoveries).*

This group comprised 21 cases, in 16 of which a differential estimate was made throughout the course of the disease. The patients were all infants and children from four months to seven years of age, unless in the instance of a girl, aged 16 years. All but three had a fatal issue, but a differential estimate was made in only one of the former (Case 29). There was so much variability in the course of the temperature in these cases that classification was impossible. The number of white cells varied markedly from day to day without relation to the course of the disease and without reference to any particular law. There was not a gradual increase to a maximum and decline to a minimum, and it cannot be stated definitely at what period of the disease the leucocytosis was greatest, as this was so variable, occurring both at the commencement, the middle, and the end of the disease. The number of white cells varied in this group between 7000 and 59,000. The leucocytosis was

due essentially to an increase, both absolute and relative, of the polymorphonuclear cells. As the majority of the cases were in infants and young children the relative percentage of these cells was naturally not increased to such an extent as one would expect to find in the adult, but it was sufficiently high to indicate in practically all instances a distinct polymorphonuclear leucocytosis. In a child aged six months (Case 30) the relative percentage of the polymorphonuclear cells was only once as high as 42, and towards the end of the disease it fell to 21. This, however, is quite physiological in a child of this age, and the case is quoted in order to show the influence that age has on the leucocytosis, as it is well known in the various pathological leucocytoses that, while otherwise one may have constantly a polymorphonuclear increase, in the case of young infants occasionally a relative and absolute lymphocytosis may be observed. In another child of younger age (Case 21), on the other hand, there were on an average 60 per cent. of the polymorphonuclear cells, which is a considerable increase for a child of that age. In three children, all aged 18 months (Cases 17, 18, and 23) the average relative percentage of the polymorphonuclear cells was 74, 80, and 83 respectively. This reveals also quite a marked increase of these cells at this period of life. In still one more instance, a patient, aged five years (Case 29), the behaviour of the leucocytosis is worthy of special description. In this case there was a form of fever with periods of apyrexia lasting from three to seven days, followed by febrile periods, remittent in character, having about a similar duration. The pyrexia lasted 160 days and the patient eventually recovered, and this was the only instance, out of the three recoveries in this group, in which a differential count was taken throughout the course of the disease. From the 121st to the 125th days, and from the 128th to the 138th days, the leucocytosis was observed every day in order to see if it varied with the rise and fall in the temperature. It was observed that the blood count was, as a rule, particularly high during the periods of pyrexia, but was of only moderate extent during the afebrile periods. On the 125th day a count of only 10,400 was obtained, but this can be explained by the fact that the period of pyrexia in that instance did not commence till the evening of that day, when the temperature reached 102·6° F. On the 128th day a count of 26,200 was obtained, although the morning and evening temperatures remained normal, but this may also be explained by the fact that the temperature had just fallen on that day and the period of apyrexia was just commencing. It cannot be definitely stated that the leucocytosis corresponded with the temperature in this way throughout the whole course of the disease, and it may be noted in this connexion that, although the patient was usually well when the temperature remained normal, at other times this was not the case. The leucocytosis in this instance was essentially a polymorphonuclear one, and this was most evident, as a rule, during the periods of pyrexia. Quite frequently, however, both a relative and absolute lymphocytosis was obtained both in the periods of pyrexia and apyrexia, although oftener in the latter, but this may be accounted for by the fact that the patient was only five years of age. In the remaining ten cases of this group in which a differential estimate was made, the leucocytosis was quite definitely polymorphonuclear. In two instances in children (Cases 27 and 28) there was a tendency towards a slight lymphocytosis towards the end of the disease.

The large mononuclear cells had an average relative percentage of 5 throughout the whole of this group. This percentage was sometimes slightly decreased and in other instances a little increased in individual cases, but remained fairly constant throughout. In consideration of the fact that the majority of the cases were in young children the percentage of these cells was somewhat reduced, although it was higher and more constant than in any of the other three groups. The absolute numbers of these cells, however, were not definitely diminished. Eosinophile cells were present also in small amount in all of these cases during their whole course, although they were practically all fatal. In the only instance (Case 29) in which the patient recovered where the differential count was done these cells were not more constant or more numerous than in the other cases which proved fatal. Basophile cells were observed in four instances (Cases 27, 28, 30, and 31) at very occasional intervals. Their absolute numbers varied from 35 to 105, thus constituting a slight basophilia. These cells, however, were not observed in the chronic case which recovered.

GROUP IV.—*Chronic Cases.*

CASES 16, 18, 21, and 30.—Case 16: Patient, aged five years, admitted to hospital on sixth day of illness; death. Case 18: Patient, aged 18 months, admitted to hospital on sixteenth day of illness; death. Case 21: Patient, aged four months, admitted to hospital on eighth day of illness; death. Case 30: Patient, aged six months, admitted to hospital on fifth day of illness; death.

Day of illness.	Temperature.		Total number of—					Percentages of—			
	Morning.	Evening.	Leucocytes.	Polymorphonuclear cells.	Lymphocytes.	Large mononuclear cells.	Eosinophile cells.	Polymorphonuclear cells.	Lymphocytes.	Large mononuclear cells.	Eosinophile cells.
			Case 16.								
	°	°						%	%	%	%
6	100·2	102·2	28,000	23,240	3080	1680	—	83·0	11·0	6·0	—
10	102·8	101·8	26,800	22,244	3216	1340	—	83·0	12·0	5·0	—
14	102·0	104·0	34,200	28,728	3420	2052	—	84·0	10·0	6·0	—
18	101·4	103·6	25,200	18,396	5296	1512	—	73·0	21·0	6·0	—
22	99·8	101·2	33,600	28,896	3360	1008	336	86·0	10·0	3·0	1·0
26	101·4	103·8	18,400	14,720	2944	414	322	80·0	16·0	2·25	1·75
31	99·4	103·2	16,800	13,944	2184	546	126	83·0	13·0	3·25	0·75
37	97·8	103·6	17,000	12,410	3570	1020	—	73·0	21·0	6·0	—
40	99·4	103·6	17,800	15,041	2180	534	45	84·5	12·25	3·0	0·25
42	97·0	101·2	19,000	17,150	1282	570	48	90·0	6·75	3·0	0·25
45	101·2	102·6	18,600	16,182	1813	558	47	87·0	9·75	3·0	0·25
47	97·8	101·6	20,000	16,000	3050	900	50	80·0	15·25	4·5	0·25
51	98·6	101·6	20,000	16,000	3200	750	50	80·0	16·0	3·75	0·25
54	100·6	102·2	18,800	15,604	2303	893	—	83·0	12·25	4·75	—
57	97·0	101·2	18,600	15,903	2092	605	—	85·5	11·25	3·25	—
61	97·0	98·0	17,400	12,832	3828	740	—	73·75	22·0	4·25	—
71	97·6	97·8	40,400	35,956	2626	1818	—	89·0	6·5	4·5	—
76	97·8	97·2	17,800	15,753	1246	801	—	88·5	7·0	4·5	—
			Case 18.								
16	99·8	99·8	16,800	—	—	—	—	—	—	—	—
21	100·2	100·2	34,200	22,657	9833	1710	—	66·25	28·75	5·0	—
25	98·8	103·8	26,800	23,919	2077	804	—	89·25	7·75	3·0	—
29	100·8	102·4	23,000	20,182	1725	920	173	87·75	7·5	4·0	0·75
37	100·4	99·6	27,400	—	—	—	—	—	—	—	—
41	100·2	100·6	22,000	17,050	3960	990	—	77·5	18·0	4·5	—
44	102·8	103·8	16,600	13,778	2158	664	—	83·0	13·0	4·0	—
48	99·8	100·2	15,000	—	—	—	—	—	—	—	—
			Case 21.								
9	103·8	103·8	59,200	36,260	20,276	2664	—	61·25	34·25	4·5	—
10	100·8	101·8	32,200	14,248	16,744	1208	—	44·25	52·0	3·75	—
11	101·2	101·8	21,000	14,542	5,618	840	—	69·25	26·75	4·0	—
13	99·8	99·8	29,200	18,396	9,490	1241	73	63·0	32·5	4·25	0·25
			Case 30.								
8	102·4	101·8	17,800	7476	9746	578	—	42·0	54·75	3·25	—
25	97·0	99·2	16,000	—	—	—	—	—	—	—	—
29	98·0	98·0	14,000	—	—	—	—	—	—	—	—
31	97·8	97·0	16,200	—	—	—	—	—	—	—	—
36	97·0	99·0	15,400	5159	9394	578	269	33·5	61·0	3·75	1·75
40	97·4	97·2	15,200	4218	10,222	456	304	27·75	67·0	3·0	2·0
44	97·0	98·0	16,400	3485	12,136	533	164	21·25	74·0	3·25	1·0

In the last of these observations 82 (0·5 per cent.) basophile cells were observed.

Value as to Diagnosis and Prognosis.

From the point of view of diagnosis, epidemic cerebro-spinal meningitis as observed in the recent outbreak quite frequently resembles tuberculous meningitis, other forms of non-tuberculous meningitis, and pneumonia, and occasionally the clinical features are not unlike those of enteric fever, typhus fever, and bubonic plague. In attempting these diagnoses the presence of a leucocytosis is only of value in excluding typhoid fever coming on with meningeal symptoms, as it is well known a leucopenia is constantly present in the latter disease unless the illness is complicated by some inflammatory phenomena. While the diagnostic significance of

the condition of the blood in cerebro-spinal fever is found to have been of importance in differentiating between that disease and enteric fever, the same cannot be said regarding its significance in the other diseases mentioned.

In regard to tuberculous meningitis, it is very often quite impossible, from the character of its onset and clinical characteristics, to distinguish it from cerebro-spinal fever. In the former disease also, unlike other forms of tuberculosis, leucocytosis of the polymorphonuclear variety is now recognised to be almost invariably the rule (Da Costa), and thus the blood examination does not assist much in the diagnosis. An increase in the number of the white cells does not seem, however, to be so constant a feature of the blood in tuberculous meningitis as in the non-tuberculous forms, so that the absence of leucocytosis rather suggests the former, although the presence of leucocytosis does not of necessity exclude it.

In distinguishing between other forms of non-tuberculous meningitis, pneumonia, typhus, bubonic plague, and epidemic cerebro-spinal meningitis, the blood unfortunately offers but little help. There is a leucocytosis in all of these diseases of the polymorphonuclear variety. The eosinophile cells are absent in acute cases of cerebro-spinal fever ending in death, and are also absent in fatal cases of typhus. These corpuscles are also recognised to be very much reduced, if not entirely absent, in unfavourable cases of pneumonia and bubonic plague. In these respects, therefore, the blood of these diseases presents similar characteristics, and an examination of that fluid alone gives little or no help in arriving at a diagnosis. The only certain method of diagnosis is by lumbar puncture, by which procedure, and from a careful study of the character of the fluid obtained, and by bacteriological tests, an accurate diagnosis can be practically always arrived at.

As regards prognosis, little can be said concerning the general leucocytosis of epidemic cerebro-spinal fever. The fact that eosinophile corpuscles were not found in the acute fatal cases has already been mentioned and may be regarded as of grave significance. These cells, however, were sometimes absent during the acute stage of an illness which eventually became chronic. It may be inferred that if these cells are present during the acute stage, an unfavourable issue will not immediately ensue, but if no corpuscles of the eosinophile type are found during the acute illness it does not necessarily mean that a fatal termination will soon follow, as the case may eventually become chronic. The degree of leucocytosis in general appears to have little or no prognostic value.

General Conclusions.

An analysis of these observations under their respective headings and of the tables in which the various blood cells are dealt with leads to the following conclusions. 1. That cases of epidemic cerebro-spinal meningitis are always accompanied by a leucocytosis, whether the attack is acute, abortive, mild, or chronic. 2. That the character of the leucocytosis is practically the same in all instances, both adults and children, and is the result mainly of an increase in the number of the polymorphonuclear cells. 3. That, nevertheless, a lymphocytosis may be very occasionally observed in infants and young children. 4. That there is a relative decrease of the large mononuclear elements alike in fatal and non-fatal cases, though less marked in the chronic type. 5. That in the first three groups there is sometimes an absolute decrease of the large mononuclear elements and occasionally total absence of these cells. In the chronic group absolute decrease, like relative decrease, is little marked. 6. That eosinophile corpuscles in acute fatal cases are always absent, although present in varying degree in all the other groups.

While bearing these general conclusions in mind the full significance of the observations can only be determined after a careful and detailed analysis of the characters and numbers of the different groups of white cells as well as of the conditions under which these are present. In the present series the highest individual count was obtained in an acute case (Case 5, Group I.), the leucocytes numbering on one occasion 66,800. This degree of leucocytosis may be regarded as a rough gauge of the intensity of the infection, as it was usually greater in severe than in mild cases. In the two abortive cases (Cases 11 and 12, Group II.) the leucocytosis was observed after the temperature had become normal and convalescence was well advanced. The normal relative percentage of the different cells was not much disturbed in these two cases, but it is necessary to bear in mind that their blood was not examined during the febrile period. In the two mild cases (Cases 13 and 14, Group III.) the leucocytosis, although polymorphonuclear, was only moderate. This may be taken to indicate that a moderately intense infection was linked to fairly well-developed resisting powers, as both these patients recovered.

It may again be noted that, although a hypo-leucocytosis was obtained from the fourteenth day onwards in one of these cases (Case 14), this may be accounted for by the injection of anti-meningococcic serum. The eosinophile cells were sometimes as high as 5 per cent. in the latter patient, who recovered, and this is interesting in view of the fact that in the acute fatal cases these corpuscles are absent. The number of white cells in general varies markedly from day to day and without relation to the course of the disease, nor can any clear relationship be established between the leucocytosis and the character of the temperature. As already stated, in one case (Case 29, Group IV.) the leucocytosis was observed to be very high during certain periods of pyrexia. This observation, however, was not invariable either as regards this patient or others. The large mononuclear cells were relatively diminished in all the cases, both in those ending fatally and in those which recovered, although not so markedly in the chronic group, so that no special significance can be attached to this fact. The occasional presence of basophile cells in four chronic cases (Cases 27, 28, 30, and 31) cannot be readily explained, unless due to the influence of some specific chemotactic substance.

It may be here remarked that myelocytes were never observed in any of the films examined. Blood platelets were always present in the blood of all the cases examined, sometimes in large numbers. No marked difference was noted in the frequency of occurrence of these elements in the fatal and non-fatal cases respectively.

As regards diagnosis, it may be again noted that the leucocytosis is only of value in excluding typhoid fever.

From the point of view of prognosis, the absence of eosinophile corpuscles in the acute stage of the disease may be considered of grave significance, but it does not necessarily mean that a fatal issue will immediately ensue as the case may eventually become chronic.

Glasgow.

A CASE OF INTESTINAL PSEUDO-PARASITISM DUE TO *CHILODON UNCINATUS* [BLOCHMANN]

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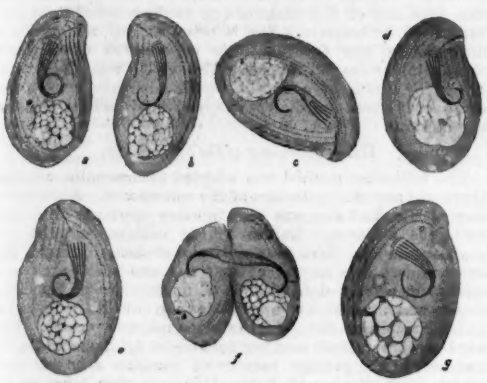
HAVING examined the blood of a person apparently healthy who had just returned from Northern Rhodesia with a fellow traveller who suffered from severe intestinal bilharziasis, a marked eosinophilia of no less than 35 per cent. was detected. This finding led to the examination of the fæces, with the result that a few eggs of *Schistosoma mansoni*, characterised by their oval shape and large lateral spine, were discovered. At a second and third examination of the fæces on two occasions some days later no trematode eggs could be found, though carefully looked for. Slides prepared from shreds of fæcal mucus presented, however, numerous specimens of *Chilodon uncinatus*.

The present paper will deal with the chilodon only. The schistosoma infection, its accompanying and foreshowing eosinophilia, the irregular voiding of the trematode's ova may be dealt with subsequently. A careful examination of the patient elicited nothing further than a slight amount of looseness of the bowels which had been his habit for several years. It may be stated that the patient, who had been a cavalry soldier, had served in India and had frequently visited South Africa. In making this statement we do not wish to convey the impression that the chilodon infection must have

been necessarily acquired in either of these places. *Chilodon uncinatus* has a very wide distribution and is a well-known form in European water bodies.

Description of the Organism.

Chilodon uncinatus (Blochmann) is an infusorian belonging to the order of the Aspirotrichous ciliates, sub-order Gymnostomata, family Chlamydodontidæ. It is a colourless animalcule. Viewed from above (see Fig. *a*) on the microscope stage it presents a subovate outline with the narrower, anterior end somewhat curved towards the left side and forming a lip-like prominence. Seen from the side (Fig. *c*) it presents a convex dorsal surface, a flat or slightly concave ventral surface, and a thick projecting border which in the living specimen gives the impression of being very flexible.



The microscopic appearances of *Chilodon uncinatus* Blochmann.

In our fixed and stained specimens the infusorian organism measures from 36μ to 44μ in length by 20μ to 30μ in width and apparently 12μ to 15μ in thickness. The body, the granular endoplasm of which stains more or less deeply in the various individuals, contains two peculiar structures which at once arrest attention. In the posterior half, we recognise a large more or less spherical nucleus, the so-called macronucleus, 12μ to 16μ in diameter, presenting a foam-like texture, and, adjacent to this or inclosed within it, a very much smaller aggregate of nuclear material, the micronucleus. In the anterior half, a curious funnel-like organelle, the shape of which suggests the conventional cornucopia, is a striking feature. It is a kind of gullet for the conveyance of food into the endoplasm. The anterior cone-shaped portion or "pharynx" of this organelle, strengthened by a fascicle of small rod-like bodies, opens on the ventral median line and at about 8μ to 9μ from the anterior extremity of the body into a circular depression usually defined as the "mouth" or "cytostome." The posterior, narrower, pipe-like portion or "œsophagus" extends to the anterior border of the macronucleus at about the middle of the body, then, curving back towards the left, forms almost a perfect circle of about 6μ in diameter. At the posterior extremity of the recurved pipe one may not infrequently observe a small pale area in the endoplasm containing particles of food, the so-called "gastric" or "food vacuole." (Fig. *d*.) The anterior portion of the gullet is protrusible and may be seen either protruded or retracted.

The "cytopyge" or opening for the rejection of excrementitious particles could not be made out in any of our specimens. It is said to be subterminal and towards the left edge of the ventral surface. The contractile vacuoles could not be made out in the majority of specimens, but in a few two such bodies were plainly seen, one on the right and above the middle of the body, the other below and to the left.

The ventral surface is bordered on either side by parallel rows of four longitudinal dotted striations representing the lines of insertion of the cilia. Each set of rows with intervening furrows start from a well-marked line running diagonally from the outer edge of the mouth towards the apex of the lip-like projection on the left. Because of the position of this line, the so-called "adoral zone," the striations on the left run straight down from anterior to posterior end, whilst those on the right must first describe a curve round the bent anterior end of the body.

There appear to be two short semicircular rows surrounding the mouth in front. The cilia are quite noticeable in the living specimens paddling about beneath the microscope, especially those of the adoral zone, which appear to be somewhat longer than the others, but in the stained specimens they can be made out only by the tiny elevations or "basal bodies" which dot the lines of their insertion. Some authors have described a dorsal row of cilia in species of the genus chilodon, but this is probably a mistake. *Chilodon uncinatus* has no dorsal cilia.

No division forms were seen, all specimens appeared to be gametes, and a few were found in the act of conjugation (Fig. *f*) attached by their oral surfaces which are not merely closely applied but apparently fused, forming a kind of bridge between the two organisms. The conjugants were for the most part of different size, probably representing macro- and micro-gametes. Some few isolated specimens presented a displacement of the food-conveying organelle from its normal position (Fig. *g*), probably subsequent to conjugation.

Hitherto, *Chilodon uncinatus* was known as a free living infusorian of fresh water bodies. It was described by Blochmann in 1897. In 1903 Dr. J. Guiart stated that he had discovered a closely allied species, *Chilodon dentatus*, in the fæces of a patient, 58 years of age, suffering from intestinal trouble. The organisms were found several days in succession in mucus contained in the fæces and only in the mucus. They measured 35μ to 55μ in length by 25μ to 35μ in width. No division or conjugation forms were described. If Dr. Guiart's determination were correct, our observation would be the first relating to the presence of *Chilodon uncinatus* in the intestine of man, but both the description and the drawing he gives of the organism refer to *Chilodon uncinatus*[1] which is characterised by the presence of two contractile vacuoles, one above, the other below the middle of the body, while in *Chilodon dentatus* there is only one contractile vacuole situated at the posterior extremity of the body. In our case, as in that of Dr. Guiart, the parasites were found exclusively in the shreds of mucus and not in the fæcal matter itself.

So far six infusorians have been described as parasites of man. They are: *Balantidium coli*, discovered in 1856 by Malmsten, a frequent parasite of the hog, occasionally found in man in association with deep ulcerations of the intestinal wall (balantidium dysentery); *Balantidium minutum* and *Nyctotherus faba*, described by Jakoby and Schaudinn in 1899 in a German, 30 years of age, who had repeatedly travelled between Hamburg and North America and was troubled with constipation alternating with diarrhœa accompanied by abdominal pain; *Colpoda cucullus*, discovered also in 1899 by Schulz in the fæces of a man suffering from diarrhœa; *Nyctotherus* (?) *africanus*[2] discovered by Castellani in 1905, at Colombo, in the fæces of a negro suffering from sleeping sickness; and *Chilodon uncinatus* found by Guiart in 1903 at Paris (but published under the name of *Chilodon dentatus*), and of which we here record a second case.

In all cases so far known in which infusoria have been found in the fæces of man the organisms were invariably associated with more or less severe intestinal disturbances. In the numerous cases of infection with *Balantidium coli* which have come under observation in various parts of the world the pathogenic action of the infusorian has been ascertained in the most definite manner. The Balantidia, like the Nyctotheri, are all parasitic forms inhabiting the intestinal cavities of host animals. On the other hand, *Chilodon uncinatus*, like *Colpoda cucullus*, is, as a rule, a free living organism inhabiting fresh water bodies. Therefore we would look upon its presence in the intestine of man rather in the light of a chance or pseudo-parasite than in that of a true parasite, not forgetting, however, that certain species of the genus Chilodon are known to live parasitically on fish and other animals. Thus *Chilodon cyprini* may be found in enormous numbers on the skin of certain fish, such as carp and gold fish (*Carassius auratus*), seldom causing great harm when restricted to the epidermis, but sometimes invading the gills, spreading down the bronchial tubes, and thus becoming deadly to their hosts.

The specimens of *Chilodon uncinatus* found by us in our

[1] Some authors believe *Chilodon uncinatus* and *Chilodon dentatus* to be identical, but the most recent authorities on infusoria describe them as two separate species.

[2] Judging from Castellani's drawing this is probably a different genus.

patient appeared for the most part reduced in size and the conjugation forms seemed to prove that the environmental conditions were not very favourable to the organism, probably owing to lack of appropriate food, for, according to Maupas, as a rule conjugation does not occur when there is plenty of food. With the more frequent examination of fæces which is being now wisely adopted, especially in the diagnosis and study of tropical diseases, we are likely to come across many other infusorians, from facultative pseudo-parasites, such as *Chilodon uncinatus*, to exclusively parasitic forms, of which the mouthless opalinidæ of amphibia are well-known examples. It may be found eventually that the infusorians play a not unimportant part in some diseases the pathology of which is still obscure.

A NOTE ON THE CULTIVATION OF *SPIROCHÆTA DUTTONI*.

BY CHARLES M. DUVAL, M.D.,

AND

JOHN L. TODD, M.D. MCGILL, M.R.C.S. ENG., L.R.C.P. LOND.

I.—*Introductory.*

DURING the first part of 1908 attempts were made to cultivate *Spirochæta duttoni* in artificial media. Although they were not altogether successful they were not without interest, since the spirochætæ multiplied *in vitro* and retained their virulence for a period of 40 days. Multiplication was observed in subcultures during three successive cultivations of the spirochætæ. Previous observers[1] who attempted to cultivate these spirochætæ were less fortunate, as they only found it possible to maintain the virulence of the parasites for rats for 27 days, and in no instance did they report multiplication through successive subcultures. The first part of this paper considers the various media on which attempts at cultivation were made. In the second part a few notes are given on the appearance and behaviour of the spirochætæ in the most favourable medium used by us.

II.—*Method of Cultivation.*

Various mixtures were prepared and tested with the view of obtaining one which might afford a suitable soil for the spirochætæ ontside of the animal body. Many modifications of the Novy-McNeal[2] blood-agar medium were employed, but attempts to cultivate the spirochætæ upon them were uniformly without success.

Very many mixtures, with varying reaction, were inoculated with the organism and placed at room and incubator temperatures. Bile salts, varying amounts of red blood cells from animals of many species suspended in weak citrate solutions, and inactivated sera in different quantities were added to bases such as agar, muscle infusion and coagulated albumins, but in each instance the spirochætæ refused to grow and lost their virulence in 48 hours. After repeated failures, egg as a medium was tried because in one instance we had noted, in contradistinction to what had occurred in other media employed, that the spirochætæ in an aqueous solution of raw egg yelk maintained their spiral form and normal structure for many days. This observation led to various modifications of the egg medium until a mixture was found in which the organism continued to multiply outside of the living host and maintained its virulence.

The successful medium is prepared as follows. The yelks of two fresh hen's eggs are carefully separated from the whites under aseptic precautions and dropped into a 200 cubic centimetres Erlenmeyer flask, to which has been previously added 100 cubic centimetres of a sterile mouse decoction, made by boiling the skinned bodies of six mice in 500 cubic centimetres of water. This mixture is thoroughly shaken until it is homogeneous, when 5 cubic centimetres of defibrinated sterile mouse blood is added to it. The flask is now sealed, to prevent drying of the medium, and placed at 37° C. for from six to eight weeks until the mixture undergoes partial digestion. The semi-fluid mass first becomes solidified and finally, through autolytic action, is broken down to a mush-like, grumous mass. In our experience this partial auto-digestion of the medium seems essential to the multiplication of the spirochætæ. If the egg mixture is coagulated at higher temperatures it seems to be no longer suitable for the growth of the parasites.

The liquefaction of the medium was certainly due to no ordinary bacterium. Each flask was carefully examined for bacteria by means of smears of medium stained by Wright's and Gram's methods. Subcultures were also made from every flask on blood-agar media of various strengths, on blood serum, plain agar, litmus milk, and on the whole series of sugar media in serum water, anaerobic cultures were attempted in deep stabs and in milk by Wright's method. Neither by direct examination nor by subcultivation were any of the flasks of egg medium found to be contaminated by bacteria. The infected animal, a mouse, was anæsthetised and the heart was exposed by opening the thorax under careful asepsis. The blood was then withdrawn by means of a sterile hypodermic syringe and a few drops of it were immediately dropped into the auto-digested egg mixture.

III.—*Behaviour of the Spirochætæ.*

The following method was adopted to determine whether there was any multiplication of the spirochætæ. A platinum loop of standard size was used in every operation connected with the cultures. Before taking culture material for examination the flask was actively shaken, by hand, for 30 seconds. One loopful of material was then taken and spread out upon a definite area of microscopic slide. This smear was stained by a modification of Romanowsky's method[3] and the slide was examined microscopically. The number of parasites seen per field (Zeiss 1/12, ocular No. 4) was noted; the average number of parasites seen per field over a large number of fields (150) was then taken as an indication of the number of parasites present in the culture.

Our most successful culture was inoculated on April 7th with six drops of blood, containing from six to ten spirochætæ to a field, taken from the mouse at the height of the first attack of its infection. The culture was then placed in the incubator at 37° C. and it was examined, as were all the cultures, at 12-hour intervals. For the first 36 hours little change was noted and the same number of parasites seemed to be present as there were just after inoculation—that is, there was about one parasite to every ten fields. The spirochætæ did, however, maintain their normal appearance and were motile.

It may be mentioned here that not only did the organisms fail to multiply in media other than the egg mixture, but they very rapidly underwent a granular metamorphosis, without regard to the reaction of the medium or to the temperature at which the culture was placed. The parasites seemed to disintegrate, became first finely granular with loss of curvature, and finally underwent complete dissolution in from three to five days. We did not observe any transformation into the so-called "resting-forms" or "coiling" of the organism under these circumstances.[4] After the third day, in the most successful of our egg medium flasks, the parasites increased in numbers. There were, on an average, four spirochætæ to each field and fields containing eight or ten occurred. The increase continued until the fifth day, when the numbers diminished. This decrease was followed in three or four days by a second increase. This fluctuation in the numbers of the spirochætæ was constantly repeated during the three weeks the culture was observed. 10 standard loopfuls of the culture, suspended in normal saline solution, were injected into a wild mouse.[5] Five days later it was found to be infected.

On April 24th a second flask of egg medium was subinoculated from the first culture with 10 loopfuls of the liquid part of the medium. The spirochætæ multiplied in

[1] Williams and Stenhouse Williams: Memoir XXI. of the Liverpool School of Tropical Medicine, pp. 101–110.

[2] Laveran and Mesnil: Trypanosomes et Trypanosomiases, translated by Nabarro. Baillière, Tindall, and Cox, 1907.

[3] Mallory and Wright: Pathological Technique, p. 370, Saunders and Co., 1904.

[4] Dutton and Todd: A Note on the Morphology of Spirochæta Duttoni, THE LANCET, Nov. 30th, 1907, p. 1523. Breinl: On the Morphology and Life-history of Spirochæta Duttoni, Annals of Tropical Medicine and Parasitology, vol. i., No. 3, Nov. 9th, 1907. Mayer: Beiträge zur Morphologie der Spirochaeten (Sp. Duttoni), Archiv für Schiffs- und Tropenhygiene, Band xii., Beiheft 1., 1908.

[5] Wild mice were regularly used for maintaining the strain of *Spirochæta duttoni* employed. None of them were ever found to be naturally infected with *Spirochæta laverani* or any other spirochæta.

this subculture and, as was shown by the successful inoculation, with 10 loopfuls of medium, of a wild mouse on May 17th, they were still virulent after 40 days' cultivation and one transfer in an artificial medium.

An attempt at a second transfer was made on May 1st, when a third flask of the egg medium was inoculated with 10 loopfuls of liquid medium from the first transfer. It was almost impossible to find the spirochætæ in smears, made immediately after inoculation, of medium from this second subculture. After the second day they were decidedly more numerous. Hence multiplication probably occurred in the second as in the first subculture. Motile parasites, however, were never seen in it and it did not infect rats which each received 3·3 cubic centimetres of it on June 3rd.

Although very little reliance can be placed upon the appearances noted in spirochætæ living in such a thick and obscuring medium, we think that we have seen enough to suggest that there were distinct though irregular rises and falls in the number of parasites present. Chains of spirochætæ, joined end-to-end and extending quite across the field, were often seen. The parasites forming these chains seemed to retain their coils especially well. Pairs and triads of parasites joined at their extremities and arranged in various positions occurred at all periods; clumps of spirochætæ were never observed.

The majority of the spirochætæ were of normal length; the longest single parasite seen measured 22·2 μ. Small forms measuring from 12 μ to 14 μ in length were often seen, and these, in the warm stage, seemed to be especially motile. Spirochætæ with irregularly fragmented chromatin and with large chromatic extra-corpuscular granules were not infrequent, but none of the coiled encysted forms, which have been seen in organs and in ticks, were ever observed.[6]

The multiplying forms (longitudinal division was not seen) were always evenly distributed throughout the slide. Nothing was seen to suggest that the multiplication of the parasites, which undoubtedly occurred at some period in these culture flasks, was confined to any small area. Multiplication also probably occurred in some of the other media employed; but only in the egg media was it well marked. Needless to say, it is our intention to repeat the observations recorded here at the first opportunity.

IV.—*Conclusions.*

From the facts presented in this preliminary communication we reach the following conclusions: 1. *Spirochæta duttoni* can be maintained virulent for wild mice in artificial media for 40 days. 2. *Spirochæta duttoni* will multiply and can be successfully transferred in artificial media.

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URÆMIA OR MENINGITIS?[1]

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ASSISTANT PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITAL, AND PHYSICIAN, HOSPITAL FOR SICK CHILDREN, GREAT ORMOND STREET.

THE patient, a boy, aged ten years, was admitted to the Hospital for Sick Children, Great Ormond-street, on Jan. 25th, 1908. Three weeks previously his mother had noticed that his urine was "black," although in other respects he had appeared to be quite well. Micturition was frequent and the quantity of urine passed was thought to have been rather above than below the normal. The boy began to complain of vertical headache one week after the commencement of his illness, and the headache had kept him awake at night. His appetite had failed, and he had vomited after food on three occasions. His bowels had been confined. There had been rapid wasting and febrile disturbance, but no delirium and no convulsions. Some rigidity of the neck muscles had been noticed. His mother stated that she was nursing three children with scarlet fever at the time of the birth of the patient, and said that he was "born with scarlet fever." He had had measles at the age of two years.

On admission to the hospital there were no œdema and on desquamation. The boy lay curled up in bed and resented being disturbed. He answered questions, but talked incoherently at times. He was very pale and emaciated. The temperature was 99·4° F., the pulse was 100 and regular, with tension rather high for a child—125 millimetres of mercury—and the respirations were 28 per minute. The patient took milk fairly well, but vomited once on the day of admission. The tongue was covered with a brown fur and the breath was offensive. Six loose stools, dark in colour, were passed, and only 325 cubic centimetres of urine could be collected in the first 24 hours, there being some incontinence. The urine was smoky, with a copious deposit of urates tinted with blood, and had a specific gravity of 1020, the reaction being acid. Blood was shown to be present in considerable quantity and a dense cloud of albumin was thrown down on boiling with acetic acid. Granular and blood casts were found in the deposit. The area of cardiac dulness was normal. The first sound was reduplicated, but no murmur was audible at any orifice. Nothing abnormal was found in the lungs. The respirations tended to be grouped at times. General tenderness was complained of; there was rigidity of the neck muscles and pain when the head was raised. The abdominal reflexes were normal. The abdomen was retracted and tender on palpation; neither liver nor spleen could be felt. The knee-jerks were brisk and foot clonus was elicited on the right side. The left plantar reflex was extensor; that on the right side was not obtained. Kernig's sign was well marked in both legs; a tache cérébrale was observed. The ocular movements were normal. The pupils reacted well to accommodation, but only feebly to light. There was no optic neuritis or retinitis, and no amaurosis. During the first days in hospital the temperature varied between 99·4° and 101°. On Jan. 26th active delirium supervened of a peevish type, and the patient greatly resented any disturbance. Head retraction was more marked than before. There was incontinence of urine and fæces, but 675 cubic centimetres of urine were collected. The patient's aspect at this period and the whole symptom-complex which he exhibited were very suggestive of meningitis, but in view of the condition of the urine it seemed desirable to treat the case as possibly one of uræmia. Dry cups were therefore applied to the loins and hot-air baths were administered. The pulse tension and the palpability of the radial artery suggested that the nephritis was chronic rather than acute. On the third day (Jan. 27th) only 275 cubic centimetres of urine were collected. Some puffiness of the face was noticed. The patient lay quietly, answered when spoken to, but resented being disturbed. Yawning and grouped breathing were noticed at times. Headache was still a prominent symptom. On the 28th a lumbar puncture was made, but no fluid was obtained. On the morning of the 29th there was an apparent improvement. The pulse tension had fallen to 95 millimetres. There was still incontinence and only 525 cubic centimetres of urine could be collected. There was less albumin, but casts were still present. Rigidity was less marked. In the afternoon vomiting occurred, the temperature rose to 103°, and there was a return of delirium. On the 30th the boy was very drowsy and rigidity was again more pronounced. On the 31st there was less rigidity and the temperature did not rise above 99·2°. The boy vomited once. The urine of this day yielded only a slight cloud of albumin. On Feb. 1st there was a decided improvement; the patient was conscious and complained of vertical headache. 700 cubic centimetres of urine were collected. The temperature did not rise above the normal. On the 3rd the improvement continued. There was less rigidity. 825 cubic centimetres of urine were passed which contained only a trace of albumin. Incontinence had ceased. During the next few days the prominent symptom was slowness and irregularity of the pulse, which from 100–120 had fallen to 60 per minute. From this time onwards there was steady and uninterrupted improvement. The pulse quickened and became regular. Rigidity disappeared only gradually, and only on the 17th was it stated in the notes to have disappeared. The hot-air baths which had been given daily were discontinued on Feb. 10th. The pulse tension fell to 84–90 millimetres; the urine of 24 hours usually exceeded a litre, and on the 18th it gave no reaction of albumin. Traces of albumin appeared occasionally up to March 11th, but after that date, until the discharge of the patient on April 6th, no albumin was found on any day. The boy increased rapidly in weight and left the hospital apparently quite well, taking an ordinary diet and exhibiting no symptoms indicative of a lesion of the nervous system. The

[6] Vide Note 4, supra.

[1] A paper read before the Clinical Section of the Royal Society of Medicine on March 12th, 1909.

increase of weight was from 3 stones 4½ pounds to 4 stones. Since then he has reported himself at intervals. On one or two occasions soon after his discharge traces of albumin were found in his urine; but none has been present for a number of months past. He continues in excellent health and shows no trace of his grave illness.

It is obvious that more than one diagnosis of the case described is possible, and its fortunate outcome, together with the failure to obtain any cerebro-spinal fluid by lumbar puncture, render certainty of diagnosis impossible. It may be contended, on the one hand, that the boy had meningitis and that the renal trouble was a manifestation of the same infection. I fully expect that some of my hearers will prefer this interpretation. The absence of any local suppurative focus excluded a meningitis by extension, a tuberculous or pneumococcal origin is equally improbable, and if meningitis was present it was probably due to the meningococcus and the case a sporadic one of the cerebro-spinal variety.

In his article on Cerebro-spinal Meningitis in Osler's "System of Medicine," Koplik[2] mentions that in many cases of that disease a mild parenchymatous nephritis is met with, evidenced by the presence in the urine of traces of albumin and of a few casts. He adds that in some cases there is blood in the urine at the outset, with albumin and casts, but that in such cases a petechial eruption is usually a prominent symptom. If this boy had cerebro-spinal meningitis his case was one of a mild kind, as judged by the absence of cutaneous hæmorrhages, the comparatively slight fever, and the fairly rapid and complete recovery. Although the rigidity did not wholly disappear until some three weeks after his admission, the course of convalescence differed very widely from that in any case of meningitis ending in recovery which I have ever seen. Moreover, we have the mother's evidence that the hæmaturia was the first symptom noticed, and that it preceded the graver cerebral symptoms by nearly three weeks, although headache was a prominent symptom throughout.

The alternative explanation, to which I myself incline, largely as the result of watching the case through its several stages, is that the case was primarily one of acute nephritis and that the "meningismus" represented an unusual form of uræmia. Such a diagnosis would be more audacious if it were not for the fact that cases of uræmia are on record which presented symptoms closely resembling those witnessed in this case. Jaccoud,[3] who first described such "urémie tétanique" in 1867, refers to three cases, all of which proved fatal, and in none of which was any meningeal lesion found post mortem. He emphasised the importance of recognising the fact that such cases occur, and the very close resemblance which they present to cases of cerebral or cerebro-spinal meningitis, and adds: "Lorsqu'une complication insolite vient ajouter de la fièvre aux convulsions et à la perte de connaissance, ce n'est plus de la ressemblance, c'est une identité parfaite, et l'erreur ne peut être évitée que par l'examen attentif de la sécrétion urinaire." In our case the fever was not more pronounced than is not uncommonly the case in acute uræmia. The convulsions to which Jaccoud refers are tonic and not clonic. Canac,[4] too, has recorded a case of a woman, aged 24 years, which was diagnosed as one of tuberculous meningitis with pulmonary tuberculosis, but in which the only lesions found after death were interstitial changes in the kidneys and congestion of the apex of one lung. Weiss[5] records two remarkable cases, both diagnosed as cases of tuberculous meningitis, in which post mortem the only lesions found were in the kidneys. I may quote the brief account of one of these cases. The patient (a man, aged 27 years) was admitted to hospital in an unconscious condition and exhibited conspicuous rigidity of the neck, trismus, tonic contraction of the extensors of the limbs, and paralysis of the bladder and intestine. Owing to the patient's state no history could be obtained, and no examination of the urine was made. The clinical diagnosis was tuberculous basic meningitis; at the necropsy granular kidneys were found as the sole cause of the phenomena which had been observed.

I know of no recorded case of recovery following an uræmic attack of this variety. In our case it certainly appeared that treatment undertaken upon the uræmic theory was followed by beneficial results, and the subsidence of the cerebro-spinal symptoms appeared to go hand-in-hand with the improvement in the renal condition. As none of the recorded cases of *urémie tétanique* seemed to have ended in recovery there is no means of judging whether the rigidity was exceptionally long in disappearing. Its complete clearing up would seem to have been unexpectedly delayed for uræmia and unexpectedly rapid for meningitic rigidity.

Chandos-street, Cavendish-square, W.

[2] Osler's Modern Medicine, 1907, vol. ii., p. 509.
[3] Clinique Médicale, 1867, p. 737.
[4] Bollettino delle Cliniche, 1885, vol. ii., p. 247.
[5] Wiener Medicinische Wochenschrift, 1881, vol. xxxi. p. 91.

A CASE OF MALIGNANT DISEASE OF THE NASO-PHARYNX.

BY WILLIAM STUART-LOW, F.R.C.S. ENG.,
SURGEON TO THE CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL.

THE patient, a man aged 35 years, was sent to the hospital by Mr. C. J. Lathbury of Dunstable on account of increasing deafness, especially in the right ear, nasal obstruction and intonation, recurrent hæmorrhage, and painful cervical swellings. He had been subject to attacks of influenza for years, but otherwise his general health had been good. During the last year he had felt weaker and easily tired, and experienced some difficulty in breathing and swallowing at times. He had lost the sense of smell during the last few weeks and had suffered much from headaches, the pain starting in the mass of glands on the right side of the neck. The nasal obstruction was of three months' duration and was getting gradually worse. The deafness was of five weeks' standing but the nasal hæmorrhage was of recent origin. He had a large mass of soft, freely moveable glands in the posterior cervical triangle extending forwards under the sterno-mastoid muscle. This had given rise to a considerable amount of pain for a fortnight, preventing sleep. On the left side of the neck there existed a smaller swelling in the anterior triangle below the angle of the jaw. On inspecting the naso-pharynx it was seen to be filled with a fleshy-like mass having an irregular surface and on palpation a soft substance was felt occupying the whole cavity. This bled very freely on palpation; it seemed attached to the roof by a broad undefinable base. A piece was removed for microscopic examination when much hæmorrhage occurred, necessitating plugging with gauze soaked in a solution of adrenalin. His heart being weak and dilated, and his spleen and liver enlarged, it was not thought safe to give him a general anæsthetic. It was therefore decided to trust to local anæsthesia—viz., an injection of a 1 per cent. cocaine solution. Two drachms of the solution having been injected over the site of the skin incision, the large mass of glands on the right side was excised. He stood this so well that it was determined to remove the other enlarged glands and perform the laryngotomy also under local anæsthesia next day. Laryngotomy having been rapidly performed and the glands excised, the pharynx was firmly plugged with a large captive-sponge and the growth in the naso-pharynx removed with forceps, bent scoops, and scrapers. The bleeding was very free indeed, and it was necessary again to plug the naso-pharynx with a large gauze plug soaked in adrenalin chloride solution and wait five minutes before resuming the scraping off of the remains of the growth. This having been satisfactorily accomplished, the naso-pharynx was firmly packed with a long gauze plug and the end brought through the mouth and secured. Next day this was removed, but there was no recurrence of the bleeding, and the patient made an uninterrupted recovery and returned home in six days. Immediately after the operation and before the patient was removed from the table he was noticed to have much ecchymosis of the lids of the right eye—a veritable black-eye; this gradually disappeared but had not quite gone when he left for home. It doubtless testified to the thoroughness of the scraping, being most likely caused by interference with the periorbital venous circulation from rupture of veins leading into the pharynx.

Dr. V. H. W. Wingrave reported the growth to be an endothelial sarcoma. It is now seven weeks since the operation and as yet no recurrence has occurred. The case proves the value of local anæsthesia in reducing to a minimum the risks

of such an operation, and the imperativeness and importance of removing such growths without hesitation or delay.

Harley-street, W.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SURGICAL SECTION.

Urachal Cysts.

A MEETING of this section was held on March 9th, Mr. J. WARRINGTON HAWARD being in the chair.

Mr. ALBAN H. G. DORAN read a paper entitled "Urachal Cyst simulating Appendicular Abscess; Arrested Development of Genital Tract; with Notes on Recently Reported Cases of Urachal Cysts." He said that the patient was a girl, aged 17 years, who had had a sudden attack of pain in the right iliac fossa, and one month later a tender swelling was detected occupying the right iliac region and extending to the middle line. It did not increase in size during menstruation. The vagina was two inches in length, ending in a blind pouch. At the right extremity of this pouch was an orifice whence menstrual blood was observed to trickle. A uterine sound introduced into the orifice passed for three inches to the right along the lower pole of the swelling, which did not bulge into the vagina but lay behind it. There was a firm soft body under the swelling to the left of the menstruating tract. The vulval structures were normal. On operating the swelling was found to be a cyst lined posteriorly by the parietal peritoneum. A thick cord, which proved to be a segment of the urachus, ran from the bladder into the cyst, which contained half a pint of clear, odourless fluid. There were omental and intestinal adhesions to the parietal peritoneum lining the back of the cyst. There was no collection of retained menstrual blood. As the relations of the back of the cyst to the ureters and the ill-formed genital tract were very intimate, yet not to be defined with accuracy, the cyst was not extirpated. The inner wall was trimmed away as much as possible and the cavity closed with catgut sutures, passed into the surface of the outer fibro-muscular wall. The stump of the urachus was carefully transfixed and ligatured to avoid all risk of urachal fistula. The patient made a good recovery. Two months later the ill-developed upper part of the genital tract could be defined as a right cornu which transmitted menstrual blood and moved freely with the soft body to its left, probably a still less developed left cornu. The right ovary could be felt at the operation. He advocated further study of the urachus in the adult after the method of Wutz and Binnie. The precise nature of Wutz's vesico-urachal valve and the question of a persistent meso-urachus, a fœtal condition, in the adult must be taken into account. Binnie, Keith, and others have observed a persistent meso-urachus, and Delore and Cotte have reported a case of an intra-peritoneal urachal cyst. Turning to morbid conditions, Mr. Doran insisted that for surgical reasons dilatations must be classified as: (1) urachal fistulæ; (2) primary cystic fistulæ; (3) pure urachal cysts, the subject of this communication; and (4) secondary cystic fistulæ developed from pure cysts which have acquired communication with the bladder or with the surface at the umbilicus. Hoffman's and Lawson Tait's cases were now admitted to be spurious. Mr. Doran recorded a few instances of pure urachal cyst not included in Weiser's tables (1906) and added an original report of a cystic sarcoma of the urachus removed by F. S. Eve from a male patient. In his (Mr. Doran's) case there must have been some relation between the anomaly in the urachus and the arrested development of Müller's ducts. The asymmetry which in this case suggested appendicular abscess had been observed by other surgeons (Douglas, Weiser) and detected in incipient cysts by pathologists. Peritonitis around a urachal cyst was very common and might lead, especially in a young subject, to a diagnosis of encysted dropsy associated with tuberculous peritonitis, and the reverse error had been frequently made. A urachal cyst should always be removed if possible, but total extirpation had been found impracticable for many reasons in many cases.

The paper was discussed by Mr. F. S. EVE and Mr. W. G. SPENCER, after which Mr. DORAN replied.

CLINICAL SECTION.

Exhibition of Cases.

A MEETING of this section was held on March 12th, Sir THOMAS BARLOW, the President, being in the chair.

Mr. JAMES SHERREN showed the following cases. 1. Musculo-spiral Paralysis of unusual origin in a male, aged 26 years, who had fractured his left clavicle playing football two and a half years ago. The arm was put up in Sayre's position with bandages. Subsequently he had an operation for malunion of the clavicle; the patient said that "the nerve was not touched." He came under observation at the London Hospital on March 4th, 1909. All the muscles in the forearm supplied by the musculo-spiral nerve were paralysed, the supinator longus, extensors of the carpus, and fingers and thumb. The healthy condition of the triceps limited the injury to the lower third of the arm; the associated paralysis of the supinator muscles marked its peripheral origin. The only suggestion put forward with regard to the cause was that it was the result of the bandaging, although Mr. Sherren had never seen the nerve injured in this way in any previous case. 2. A case illustrating an unusual cause of Musculo-spiral Paralysis and the late result of Neurolysis in a man, aged 23 years, who, on March 4th, 1904, caught his left arm between the rollers of a planing machine. When operated on later the nerve was found densely imbedded in fibrous tissue, but its anatomical continuity was uninterrupted. The nerve was freed and surrounded with oiled silk. The oiled silk came away six weeks later. Three and a half months after this operation voluntary power returned to the wrist and fingers. 3. A case showing the late result of Secondary Suture of the Musculo-spiral Nerve in a boy, aged nine years, with paralysis of all the muscles of the forearm supplied by the musculo-spiral nerve. On June 28th, 1903, he had fractured the lower third of his humerus. This had been reduced by open operation; the paralysis "was noticed several days later." An operation on August 3rd showed that the nerve had been divided; the ends were sutured and the wound healed by first intention. Ten months from the date of operation all the muscles supplied by the nerve acted voluntarily and reacted normally. 4. A case of Secondary Suture of the Median Nerve three months after division, showing a stage in recovery in a man, aged 34 years, who fell from his bicycle on July 10th, 1907, and put his hand through a glass window. On Oct. 16th of the same year operation showed an inch separation between the ends of the median nerve; the ends were freed, freshened, and united with fine chromic gut. About eight weeks after suture the area of loss of prick began to diminish in extent, and nine months after suture had disappeared. The area of loss of light touch was now beginning to diminish in extent. Nine months after suture there was no return of motor power or change in the electrical reactions. The opponens pollicis was now acting, but there was not any return of voluntary power in the abductor pollicis; both reacted to stimulation with strong interrupted currents. 5. A case illustrating the late result of Primary Suture of the Median Nerve at the Wrist in a male, aged 21 years, who cut his right wrist with a knife on Oct. 2nd, 1902. Primary suture was performed on the following day. Three years after the date of the primary suture he said that the hand was as well as it was before the accident. He still showed slight wasting of the outer group of the thenar muscles. 6. A case of Injury of the Median Nerve from an unusual cause, with the formation of trophic blisters in a man, aged 36 years, who on Dec. 11th, 1908, fell nine or ten feet from a window-sill and hurt his hand, probably by a fall on the out-stretched palm. Eight weeks ago he put his hand into water, not uncomfortably hot for the sound fingers, and produced blisters on both surfaces of the index and middle fingers and the palmar surface of the terminal phalanx of the thumb. These areas were still insensible to prick and to light touch when examined on Feb. 26th for the first time. The hand was held with the thumb in the median position. The abductor and opponens pollicis muscles were weak but acting. This case was regarded as an example of injury to the median nerve below the point at which its palmar

cutaneous branch is given off. 7. A case of Division of the Ulnar Nerve below its Dorsal Branch in a man, aged 24 years, who sustained an incised wound of the wrist on Oct. 28th, 1908, dividing the ulnar nerve below the point at which its dorsal branch is given off. Primary suture was performed the same day, and he was discharged to the out-patient department on Nov. 18th, with the typical sensory loss. All the intrinsic muscles of the hand supplied by the ulnar nerve were paralysed. 8. A case of Complete Section of the Anterior Primary Division of the Fifth Cervical Nerve together with, or above, the nerve to the rhomboids, in a man who on July 31st, 1905, fell off a wall on to some railings, a spike of which penetrated his neck. All the muscles supplied by the fifth cervical were found paralysed on Oct. 18th of the same year. On Oct. 25th Mr. J. Hutchinson explored the plexus in the neck. The distal portion of the fifth cervical nerve was traced upwards into a dense mass of fibrous tissue from which it was dissected out with difficulty; it was united with what appeared to be its central end. All the affected muscles were still paralysed and gave the reaction of degeneration. 9. A case of Chronic Neuritis of the Ulnar Nerve due to deformity in the region of the elbow, treated by resection of the damaged portion of the nerve, in a man, aged 36 years, with a marked deformity in his left elbow due to epiphyseal injury in early life. The ulnar nerve could be felt enlarged in a spindle-shaped manner behind the internal condyle. On June 17th, 1904, the spindle-shaped swelling was excised, one and three-quarter inches of the nerve was removed, and then after a groove had been chiselled in the posterior surface of the condyle and lined with gold foil the nerve was sutured and the junction surrounded with foil. 132 weeks from the time of suturing all the intrinsic muscles of the hand were acting and reacting to the interrupted current, but were very wasted. He returned to his work in August, 1906. Recovery is not perfect. The hand is still in the "ulnar" position with marked wasting of the intrinsic muscles supplied by the ulnar nerve. 10. A case of Chronic Neuritis of the Ulnar Nerve in the Region of the Elbow in a man, aged 42 years, who came under observation at the London Hospital on Feb. 26th last on account of wasting of the muscles of the left hand. About the age of 15 years, and at intervals since, he had noticed occasional numbness of the ulnar side of the hand; these attacks soon passed off, but at the age of 22 years, after sleeping "with his elbow on a board," the ulnar side of the hand was numb for six or seven weeks. Four years ago he had a blow on the palm of the left hand. He had noticed a gradual loss of power in the hand for a year, and for six or seven months the little and ring fingers had been "getting bent up." The fingers were held in the "ulnar" position; all the muscles supplied by the ulnar nerve were wasted, paralysed, and gave the reaction of degeneration. The ulnar nerve was very prominent behind the internal condyle, and was enlarged in a spindle-shaped manner. There appeared to be some bony thickening beneath the ulnar nerve.

Mr. A. H. TUBBY showed three cases of Nerve Anastomosis—in the first, a man, aged 19 years, he performed a facio-hypoglossal anastomosis for post-operative paralysis which resulted in nearly complete recovery; in the second case, a boy, aged nine years, he implanted the nerves to the gastrocnemius and soleus into the external popliteal trunk for infantile paralytic talipes calcaneus of seven years' duration, whereby a great improvement was effected on the original condition; and in the third case, a man, aged 23 years, he operated successfully for supraclavicular paralysis of the brachial plexus.

Mr. C. H. FAGGE showed a case of Post-operative Facial Paralysis treated by facio-hypoglossal grafting, and a case of Inflammatory Facial Paralysis treated by facial-accessory anastomosis. In this last case the trapezial portion of the spinal accessory was divided in front of the sterno-mastoid and an end-to-end union made between it and the distal end of the divided facial.

Mr. W. MCADAM ECCLES showed a case of Charcot's Disease of the Right Ankle-joint.

Major C. G. SPENCER, R.A.M.C., showed a case of Sarcoma treated by injections of Coley's fluid. The patient was a man, aged 33 years, who was seen in August, 1906, with a large growth in the lower part of the abdominal wall, infiltrating the recti, attached to the pubic symphysis, and extending down in front of the bladder so that it could be felt per rectum. A piece of the tumour was removed for examination and reported to be a spindle-celled sarcoma. An attempt to remove the growth having failed, owing to wide involvement of the peritoneum, injections of Coley's fluid were commenced on Sept. 22nd, 1906, 12 injections being given, but apparently without effect. He then left hospital for two months and returned much improved in general health and with decided diminution in the size and hardness of the growth. A second series of 15 injections was given, and after another interval of a month a third series of 19 injections, making 46 in all. Since the end of March, 1907, he had not had any further treatment; the tumour had completely disappeared and he had continued in perfect health. The dose of the fluid injected was determined by the amount of reaction produced; a sharp reaction with a temperature of 101° or 102° F. was aimed at; at first this was produced by three minims, which subsequently had to be gradually increased to six minims. The injections were given every second or third day into the substance of the growth. During the treatment the patient's general health deteriorated; he lost weight and suffered a good deal from headache and from pain in the tumour, marked local inflammatory reaction being produced as well as the general reaction. Improvement in the tumour itself was most noticeable some time after each series of injections and his general health also showed marked improvement then.

Dr. H. D. ROLLESTON showed a case of Lymphadenoma with varying Jaundice.

Mr. LAWRIE H. MCGAVIN showed a case of Perineal Hernia in a woman, aged 36 years. Two years ago she complained of dragging pain, resembling a labour pain, in the right iliac fossa, and nine months ago she felt a moveable "lump" in the abdomen. Her medical man did not detect this lump, but he discovered a swelling in the ischio-rectal fossa, which was quite small and easily reducible. Six weeks ago the patient returned with the hernia very much larger, but she did not have any inconvenience referable to implication of the pelvic organs in the hernia. When the mass had been reduced a gap admitting two fingers could be felt in the central portion of the levator ani muscle, the hernia coming down alongside of the vagina and rectum, through either of which the impulse on coughing might be detected.

Dr. E. OPENHEIM showed two cases of Septicæmia and one of Tetragenus Septicæmia treated by Vaccine Therapy.

Mr. H. GOODWYN showed a case of Streptococcal Infection producing erythematous patches that resisted treatment.

Dr. W. E. WYNTER showed three cases, one of Pulmonary Stenosis, another of Infantile Paralysis, and a third of Ascites cured by permanent drainage through the femoral ring.

Dr. A. E. GARROD read a paper entitled "Uræmia or Meningitis?" which is printed on p. 835 of this issue of THE LANCET.

The meeting, which was prolonged to a late hour, concluded with the reading of a paper by Dr. H. MACNAUGHTON-JONES on a case of Malignant Tumour in the Spinal Meninges with Invasion of the Cord, secondary to Carcinoma of the Mammary Gland, with Other Metastases.

THERAPEUTICAL AND PHARMACOLOGICAL SECTION.

The Treatment of Spasmodic Asthma.

A MEETING of this section was held on March 2nd, Dr. T. E. BURTON BROWN, C.I.E., the President, being in the chair.

Dr. R. C. B. WALL opened a discussion upon the Treatment of Spasmodic Asthma. He said that in few diseases had theory played so large a part in suggesting treatment as in spasmodic asthma. Yet there was little unanimity of opinion save on the one point that during the attack the bronchial tubes were diminished in calibre, and that this diminution was probably effected through the agency of the central nervous system. The hypothesis of bronchial muscular spasm was supported by the work of Brodie and Dixon. Prophylactic treatment attempted to prevent the origin of these nervous impulses in the central nervous system or to hinder their passage to the lungs. Symptomatic treatment attempted to widen the bronchioles by removing the turgescence of the mucous membrane or by relaxing the tone of the bronchiole muscles. Dr. Wall referred to the importance of the environment of

the patient, the climate, and general hygiene in preventing attacks. Asthma was sometimes associated with nasal abnormalities. He had notes of 23 cases of asthma associated with definite nasal defects. After suitable treatment to the nose in 14 there was marked improvement. In none was complete cure recorded. He enumerated some of the symptomatic remedies in common use. He had found most useful iodide of potassium, arsenic, and stramonium. Of the last, the extract was better than the tincture. The pharmacopœial dose was excessive, yet it should be given in doses sufficient to cause slight toxic symptoms. Most patients showed toxic symptoms on taking three-quarters of a grain in 24 hours. Cocaine, even in dilute solutions, was a dangerous drug to place in the patient's hands. The nitrites, atropine, adrenalin, acetone, and other drugs he had found of benefit in some cases. Morphine was very valuable but the fear of narcomania forbade its frequent use.

Professor W. E. DIXON showed tracings indicating the diminution in the volume of the lungs which followed upon stimulation of the vagus of a cat. A similar change followed reflexly from stimulation of the nasal mucous membrane. He also illustrated the action of drugs in inhibiting the spasm. For the production of an attack of asthma two things were necessary, a "neurotic" medulla and a peripheral stimulus as the exciting cause.

Dr. A. F. HERTZ related his own personal experience of attacks of asthma. He emphasised especially the importance of urging the patient to combat the tendency by an exercise of will power. In his own case an attack could often be greatly lessened if he resolutely persisted in pursuing some mental work requiring complete concentration of mind. If an attack was anticipated by the patient an attack generally came. The subject of asthma must learn to avoid the places in which experience taught him that he was liable to attacks.

Dr. E. I. SPRIGGS referred to the good fortune of the section in having at first hand from Professor Dixon an account of the valuable work which he and Dr. Brodie had done upon the mechanism of spasmodic asthma. The research was not only a credit to British physiology but of the greatest value to medicine. The treatment could be divided into the treatment of patients between the attacks and the treatment of the attack. He referred to the details of 40 of his own cases of which he had notes. In his experience those patients who were entirely free between the attacks offered a prospect of successful treatment, whilst those in whom the severe attacks altogether subsided, giving place to a chronic dyspnœic condition, with comparatively few exceptions, were difficult to treat. It was surprising what benefit followed attention to simple hygienic measures, such as the digestion, especially the abandoning of an evening meal, the regular action of the bowels, and the avoidance of fatigue. He quoted cases in which strict attention to these measures had produced excellent results. In one of his cases the attacks began with tertiary syphilitic eruptions. In another the attack came on on Monday morning after a weekly drinking bout and ceased on discontinuing the use of beer. He had seen relief follow nasal treatment, and the reverse. In one case a series of most severe attacks were precipitated by the removal of polypi. It was important to recognise the neurotic form of asthma, in which the entry of air into the chest was not really impeded, as the superficial aspect of the patient almost exactly resembled asthma. He had seen good results from respiratory exercises and asked Dr. Wall whether the treatment by compressed air was still used at the Brompton Hospital. For the relief of more severe attacks he had had good results with the injection of 1-100th of a grain of atropine repeated in an hour if necessary. Short of morphine and chloroform he used atropine and amyl nitrite most often. If amyl nitrite were used, it was important that directly the relief was afforded the patient should be kept quiet and should go to sleep. If sleep could be secured before the attack returned the patient might wake up with the worst of the asthma gone. He referred to a case reported by Kaplan and Brooks, in which 2000 injections of a 1 per cent. solution of atropine in doses of from 10 to 120 drops had been given in three years. Nodular thickenings and necrosis of the arteries were produced. He did not think, however, that such effects were likely to follow reasonable treatment by adrenalin.

Dr. D. W. CARMALT-JONES said that working in the laboratory of Sir Almroth Wright he had recently isolated a micro-organism which he believed to be the cause of certain cases of asthma. He spoke of cases where the paroxysmal dyspnœa was accompanied by severe and chronic bronchitis. He had prepared a vaccine, and in many cases he had seen great improvement in the dyspnœa.

Dr. J. GRAY DUNCANSON emphasised the importance, especially in the young, of prescribing a course of breathing exercises, thoroughly carried out and supervised.

Dr. WALL replied.

OPHTHALMOLOGICAL SOCIETY.

Congenital Anterior Staphyloma.—Hereditary Cataract.—Colour Blindness.—Exhibition of Cases, &c.

A MEETING of this society was held on March 11th, Mr. W. H. H. JESSOP being in the chair.

Mr. E. TREACHER COLLINS read a paper on Congenital Anterior Staphyloma. Mr. Collins described the case of a child born with an opaque, vascular, staphylomatous cornea, who never had any discharge from the eye. When 15 months old he performed a Mules's evisceration upon it and subsequently made a pathological examination of the elliptical piece removed from the front of the eye. It was found that Descemet's membrane and the ligamentum pectinatum were absent, there was no stroma to the iris, and the lens was also malformed. Most cases of congenital anterior staphyloma have been attributed to intra-uterine ulceration. Mr. Collins thought that a case in which there was complete absence of Descemet's membrane and the ligamentum pectinatum could not be accounted for by ulceration and must be attributed to some developmental defect. He suggested that there had been a failure in the differentiation of the mesoblast which intruded between the lens vesicle and the surface epiblast into its several layers. Normally there developed from it the substantia propria of the cornea, Descemet's membrane, its lining endothelium, and the antero-fibrovascular sheath of the lens. From this latter the fœtal lens largely received its nutrient supply and the stroma of the iris was to a great extent formed. A failure in the differentiation of the several structures, or atypical development of the intruding mesoblast, might, as in the case under consideration, lead to a vascularised, thickened, fibrous mass in place of the substantia propria, an absence of Descemet's membrane, of the stroma of the iris, and a malformed lens. He concluded by referring to several other congenitally malformed eyes, in which he had found defects in development of Descemet's membrane or the ligamentum pectinatum of a less extensive character.—The paper was discussed by Mr. J. H. PARSONS and Mr. G. COATS, who failed to agree with all that Mr. Collins had advanced.

Mr. E. NETTLESHIP contributed seven new pedigrees of Hereditary Cataract: (1) 24 cases of lamellar cataract in four generations; (2) and (3) coraliform cataract, one of them containing 20 cases in four generations; (4), (5), (6), and (7) pedigrees of senile or pre-senile (or juvenile) cataract in from two to four generations, some of them illustrating "anticipation"—i.e., the occurrence of disease at an earlier age in the younger generation. Two of the pedigrees showed the introduction of a second heritable disease from an outside non-cataractous stock, goitre in one instance, insanity in the other.

Dr. F. W. EDRIDGE-GREEN and Mr. C. DEVEREUX MARSHALL submitted a paper on so-called Artificially Produced Temporary Colour Blindness. They stated that Professor Burch of Oxford had read a paper before the Royal Society, which was published in the Philosophical Transactions in 1898, giving the results of his experiments, in which he split up direct solar light with a spectroscope, and then collected the rays of the individual colours with a convex lens and saturated his own eye with any desired colour. He then examined a spectroscope illuminated with diffuse daylight and stated his results. He found that he could produce temporary colour blindness to any colour in this way. His most important point was that by saturation with light at the "D" line red and green blindness supervened and these colours could not be perceived, and this he held to support the complex nature of yellow light, the Young-Helmholtz theory of colour perception. Dr. Edridge-Green and Mr. Marshall criticised his experiments. They thought that if direct

sunlight were focussed in the retina not only temporary but probably permanent blindness might be produced, and in any case the eye would be incapable, after much treatment, of making accurate observations on a feebly illuminated spectrum. They produced fatigue in their own eyes with a sodium light and then found that yellow and orange became obliterated, and that red and green met in the spectrum, and that there was no diminution of those two colours. Other experiments were repeated with different colours and in most of them they disagreed with Professor Burch's results which, they held, were due to faulty methods of conducting the experiments. These facts were, they contended, only explicable on the psycho-physical theory of colour vision (Edridge-Green's theory).

Dr. G. CARPENTER showed a post-mortem specimen illustrating Oxycephaly, and Mr. SYDNEY STEPHENSON mentioned a similar case which had been under his care, commenting on the shallow orbit and the consequent ease of dislocation of the eyeball.

Mr. J. ROWAN showed some fine Stereoscopic Colour Photographs, by the Lumière process, of Eye Conditions.

Dr. EDRIDGE-GREEN exhibited a new form of Lantern for the detection of defects of colour vision.

Mr. PARSONS showed a case of Unilateral Optic Neuritis with White Spots in the Retina, and it provoked a long discussion, in which Mr. JESSOP, Mr. NETTLESHIP, Dr. F. E. BATTEN, and Mr. N. BISHOP HARMAN took part.

Mr. JESSOP showed a case of Keratitis Punctata with a history of erythema nodosum.

Mr. M. S. MAYOU and Dr. L. G. GUTHRIE showed a case of Optic Atrophy (Retro-bulbar) with Cerebellar Symptoms in a child.

SHEFFIELD MEDICO-CHIRURGICAL SOCIETY.—A meeting of this society was held on March 4th, Mr. P. E. Barber, the President, being in the chair.—Mr. G. Wilkinson showed: 1. A case of Partial Gastrectomy and Excision of about Ten Inches of the Transverse Colon for Carcinoma. About two-thirds of the stomach had been excised and posterior gastro-enterostomy performed. The transverse meso-colon was adherent to the posterior wall of the stomach and infiltrated with carcinoma. This necessitated resection of part of the transverse colon; the ends were closed by suture and lateral approximation was performed. 2. A case of Double Frontal, Ethmoid, and Maxillary Antral Suppuration in which radical operations had been performed on all the sinuses.—Dr. W. S. Kerr showed: 1. A case of Bilateral Abductor Paralysis of the Vocal Cords. There was no dysphagia. The case was thought to be one of perichondritis of the cricoid. There was no disease of the chest or central nervous system. The case was improving under potassium iodide. 2. Cases of Chronic Maxillary Sinusitis treated by the Radical Operation. One was followed by a severe and extensive attack of erysipelas involving the face, scalp, and neck. Slight œdema of the affected cheek still remained after six months.—Mr. Gilbert E. Mould read a paper on the Treatment of Incipient Insanity. After remarking that in spite of the diversity of mental diseases when fully developed there was at the commencement a great similarity of the symptoms, he instanced some symptoms on the physical side—changes in the circulation of the skin, loss of weight, loss of appetite, fœtor of breath, constipation, amenorrhœa, and frequently headache; and on the mental side excitement or depression, sleeplessness, alteration of character, alienation from friends and relatives, often bad dreams, and noises in the head. These symptoms together indicated the first changes and it was of great importance that treatment should be commenced in this stage, hence the responsibility of the general practitioner. The proximal cause should be sought for and removed as far as possible. Usually it would be found to be a combination of physical causes, such as toxæmias from infections or alcohol, &c., with mental causes, such as worry, shock, or bereavement. The treatment of symptoms should not be neglected on the ground that they did not constitute the fundamental change, for in a disease of which so little was known it was quite rational to treat symptoms. There were numerous exceptions to the rule that excitement must not be treated with sedatives. Many cases of early subacute mania were much improved by taking potassium bromide for a time. The depressed conditions should receive a course of tonics. The melancholic cases which were associated with increased tension benefited by iron and magnesium sulphate. In all cases the faith healing power of drugs was of value. Every little helped. Alcohol was to be avoided. Sleeplessness should certainly be treated but not necessarily every night. Paraldehyde was the best drug and could be given in doses of from 2 to 4 drachms. Before the borderline of insanity was crossed a great deal might be done by reassuring the patient and persuading him to give up bad habits such as solitude. There being an assumption that the mode of life before an attack was certainly wrong, the patient should be removed from home. This was most important, especially when the relatives were abnormal, as they so often were. The question of exercise was to be answered for the individual case. Strict Weir-Mitchell treatment was of limited utility; more recently rest in bed in the open air had been advocated. The old treatment of vigorous walking exercise gave good results in many cases. It did not follow that because a woman had broken down under the strain of tending a large family that she required absolute rest in bed. It was sufficient in these cases to have removed the strain. Nutrition was most important, and the administration of large quantities of milk might be considered as almost a specific in the treatment of incipient insanity. Meat should be restricted, especially in young people. Tobacco should be stopped, though there might be exceptions in the old. Most cases did better without tea. As a small fluid intake meant irritability, plenty of fluid should be taken. Hypnotic suggestion in the hands of a gifted reputable practitioner might be of the utmost value. The greatest obstacle to the treatment of early insanity was the difficulty which the law put in the way of the medical man who wished to place his patient under proper care.—Dr. Evelyn Milestone, Dr. Godfrey Carter, and Dr. J. W. Martin joined in the discussion.—Dr. Carter read a paper on Post-Influenzal Conditions Simulating Phthisis. He related four cases where following influenza there resulted a condition in which the physical signs completely simulated phthisis. There was apical consolidation with well-marked signs, associated with loss of weight, nocturnal temperatures of 100° F. and thereabouts, and a rapid pulse, but no tubercle bacilli were found in the sputum. All the patients recovered in the course of a few months and the physical signs completely disappeared; in one case there was a large pleural effusion.—Dr. F. H. Waddy, Mr. G. S. Simpson, and Dr. A. E. Barnes joined in the discussion and related cases where following influenza there had developed tuberculosis and the bacilli had only been found after several examinations.—Dr. Carter, in reply, said that in his cases there had been such marked signs that if they were due to tuberculosis there would almost certainly have been bacilli in the sputum. Recovery was also so complete and rapid that tuberculosis was out of the question.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—A meeting of this society was held on March 12th, Mr. Edward Sergeant, the President, being in the chair.—Dr. J. R. Kaye opened a discussion upon Amendments to the Midwives Act. He said that in the West Riding of Yorkshire the first complete roll of midwives contained the names of 1088 women, of whom 116 had certificates, while the latest roll contained only 720 names and only 45 were of certificated women. In 22 sanitary districts there was not a single certificated midwife. It was not surprising, therefore, to find that in these districts women who do not hold themselves out as midwives, but who are ready to act as such if called upon, have continued in their calling as though the Midwives Act had never been placed on the statute book. Referring to the conditions which will exist after 1910, Dr. Kaye considered that the outlook presented two serious considerations. There was the position in those districts where certified midwives are now scarce and where the work is being done by women who will be acting illegally after 1910, and there was the probable failure of the Central Midwives Board examinees to fill the gaps caused by death or retirement of the existing midwives. He urged that local supervising authorities should be empowered to expend money on the training of midwives otherwise than by the goodwill of the education authority as at present. The remedy which he suggested for the sparsely populated districts which could not possibly support a trained midwife was that the Act should be so amended as to authorise the local supervising authority to grant to suitable women a modified licence which should be applicable only for a given period and within a defined area. They should undertake to

keep a list of the cases attended and to observe primary rules, and if a certified midwife came to reside in the district the licence of the uncertified woman should be called in.—Mr. R. Musgrave Craven said that in Westmorland most of the midwifery was done by medical practitioners, and he was not in favour of the State paying for the training of midwives. He referred to the falling birth-rate as a reason for not viewing with alarm any scarcity of midwives.—Dr. Meredith Young thought that we were destroying the backbone of the country by giving everything without any payment, and he could not approve of the training of midwives by the State.—Mr. Ll. M. Bowen-Jones spoke of the uncleanly habits of the class of women proposed by Dr. Kaye to be intrusted with a modified licence and considered that they were responsible at present for a great deal of the mischievous after-effects following parturition.—Mr. J. Tubb-Thomas considered that instead of setting up a second-hand class of midwives it would be much better to coöperate with and to subsidise existing nursing associations.—Dr. J. S. Tew doubted if half-a-dozen of the midwives in his districts in West Kent made a living by the money earned in attending confinements. He considered that in every village there should be provided a qualified nurse who should also be trained in midwifery.—Dr. G. F. McCleary thought that the shortage of midwives might not be an unmixed evil, for at present a midwife was often employed by persons who could well afford to pay a medical man. He suggested that the services of the village nurse might be utilised by the school medical officer.—Mr. F. E. Cane, speaking as a general practitioner, considered that the class of woman Dr. Kaye proposed to license was a nuisance and an abomination. She fed the baby improperly, was self-opinionated, often neglectful, and all sorts of trouble resulted from her attendance.—Mr. A. E. Lyster drew attention to the serious competition between midwives and medical practitioners, and said that the latter viewed with some alarm the use of public funds for the purpose of assisting midwives to settle in rural districts.—Dr. W. Arnold Evans thoroughly approved of subsidising existing nursing associations, and the President did not consider there would be so much shortage of midwives in 1910 as was anticipated. He should view with concern the giving of licences to women who were not capable of carrying out the duties which they would be called upon to perform.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.—A meeting of this society was held on March 4th, Mr. R. F. Jowers, the President, being in the chair.—The President showed an Inflamed Appendix which he had found as the sole content of the sac of a femoral hernia; also a partially Gangrenous Appendix which he had removed from a boy on the first day of the attack. There was some cloudy fluid in the abdomen but no lymph.—Dr. A. W. Williams showed a boy with Ichthyosis, intermediate in type between linearis and diffuse serpens; there had been much improvement from resorcin in glycerine of starch and superfatted ichthyol soap. The boy's sister was also shown with slight ichthyosis.—Mr. V. T. Greenyer showed a large Sarcoma of the Ovary, weighing 8 pounds, which he had successfully removed. There were several blood cysts on its surface. The tumour had been growing rapidly and had caused ascites and given rise to severe attacks of pain.—Dr. A. J. Hutchison read notes of a case of Hæmorrhage after Tonsillotomy. A woman, aged 27 years, complained of difficulty in beginning to swallow. There were very large buried tonsils which were removed under an anæsthetic after spraying with cocaine and adrenalin, partly by enucleation and partly by a tonsillotome. There was little bleeding at the time, but nearly three hours afterwards severe hæmorrhage set in, which was stopped by pressure from a swab soaked in 1 in 2000 adrenalin. The patient had lost an enormous amount of blood, the pulse being 160 for some hours, and the condition causing great anxiety, but she made a good recovery.—Mr. G. Morgan read a paper on Rheumatic Nodules. One case he had seen was that of a boy, aged 10 years, who in October, 1907, first complained of slight stiffness in the right knee which came on at school time but did not interfere with play. A month later there were pain in the knee, a temperature of 99·8° F., and a pulse of 100; the heart sounds were normal. He was put to bed and given salicylates. About the middle of November several small tender nodules were found about the ankles, his temperature rose to 100° and later to 102°, a soft systolic bruit developed and the heart dilated rapidly, and he died in January. The nodules were very tender and very small, not larger than a millet seed. Another case, a boy aged eight years, had a plentiful crop of large nodules over the scapulæ, sacrum, ankles, and wrists, with acute articular rheumatism and mitral regurgitation, but he recovered. Mr. Morgan discussed their causation; and in relation to diagnosis related two cases in adults with rheumatic symptoms and numerous small subcutaneous nodules which turned out to be small-celled scirrhus.—Dr. Walter Broadbent read a paper on Phthisis: its Diagnosis and Treatment. He mentioned that difference in movement of the two sides of the chest was better seen from the back than the front. Myoidema was suggestive and if obtainable on one side only it was a sure sign of phthisis. On auscultation a diminished respiratory murmur was the earliest change; later harshness of expiration. Help in doubtful cases could be got from Calmette's or von Pirquet's reaction, or from the variations of the opsonic index after exertion. In people above 40 years of age emphysema, compensatory of old destruction, might disguise the signs of phthisis in front which were easily heard on listening to the back. He pointed out the difficulty of making an early diagnosis of acute broncho-pneumonic phthisis in children. He discussed hæmoptysis and its treatment. In regard to treatment he said that no patient should be allowed out of bed if the temperature was above 99°. He thought that raw meat juice was useful in acute cases, and when the temperature went down three good meals with meat or eggs and no extra milk. He described Dr. M. S. Paterson's excellent new treatment by graduated exercises, and discussed the use of tuberculin.

MANCHESTER MEDICAL SOCIETY.—A meeting of this society was held on March 3rd, Mr. W. Coates, the President, being in the chair.—Dr. J. Arnold Jones described an unusual case of Extra-dural (Peri-sinus) Abscess of Otitic Origin and its relation to melancholic stupor. The patient, a spinster, aged some 50 years, was seized with symptoms of melancholia in October, 1907, and was sent to a private asylum in December, 1907. Acute aural pain supervened in February, 1908, apparently due to external otitis. The walls of the external meatus were incised and the inflammation subsided, leaving a copious discharge of pus. There was no previous history of aural mischief. A large granulation was seen coming from the tympanum and filling the lumen of the external meatus. This was removed under anæsthesia but the discharge remained more copious than ever. Since the first incision the mental symptoms rapidly cleared up and she was pronounced cured in May, 1908. In June, 1908, a radical mastoid operation was performed, and a fistula leading from the osseous external meatus to the sigmoid groove was discovered. One and a half drachms of pus were evacuated from the sigmoid groove and recovery followed.—Mr. A. E. Barclay read a short communication on the Electrical Treatment of Incontinence of Urine in Adult Females. The object of the treatment was to induce the sensation of the desire to pass urine which the patient had to withstand—i.e., educating the brain centre to a sense of its responsibility for the action of the lower automatic one. This could be done by means of one electrode in the urethra, moved to and fro past the sphincter, and the indifferent electrode below the back. The currents used were the interrupted reversed galvanic, the faradic, and the sinusoidal. He preferred the use of the sinusoidal, as with it the desire to micturate was strongest and the painful sensations less marked. One severe case, a girl, aged 19 years, with both nocturnal and diurnal incontinence, on whom all other methods had failed, went into service after three months of treatment and now, after the lapse of a year, wrote to say that she had only been troubled once since she was under treatment.—Dr. R. W. Marsden made a short communication on Paracentesis Thoracis in Pleural Effusions, limiting his remarks more especially to the indications for the performance of the operation in cases of apparently acute primary pleurisy with effusion. He thought that too much attention was paid to the question of pleuritic adhesion occurring and relatively too little to the condition of the compressed or contracted lung. Though agreeing that in the great majority of cases the lung might regain complete expansion on withdrawal of fluid after a period of three weeks' compression, he suggested that where the temperature was maintained beyond the usual period without evidence of absorption it was advisable

not to wait so long before tapping. Considering, then, the question of a reaccumulation of the fluid, he thought that where fluid was again effused there was even greater necessity for not allowing too long compression of the lung than in the early stages, since the exuded inflammatory products responsible for the permanent contraction of the lung had in the meantime had an opportunity to become further organised. Accordingly he suggested that if steady absorption did not follow the operation should be again repeated at intervals so long as expansion of the lung could be obtained. For this purpose also he thought that a period of two weeks was the maximum during which one should allow compression of the lung whilst waiting for absorption of the fluid.—Dr. G. H. Lancashire read a paper on Dermatitis Artefacta, giving two remarkable instances from medical literature and several which had come under his own notice.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—A meeting of this society was held on March 5th, Colonel T. H. Hendley, I.M.S., the President, being in the chair.—Dr. E. Furniss Potter read a paper on the Submucous Resection Operation for the Removal of Deviations and Obstructive Deformities of the Nasal Septum. Dr. Potter explained how treatment of septal deflections and deformities had been revolutionised by the advent of submucous resection and showed that what were formerly regarded as purely ledge-like outgrowths of bone or cartilage were in reality the thickened angular summits of septal deflections, hence the sawing off of the obstructing spur was frequently disappointing as only a small shaving was removed or else a large perforation was made. Dr. Potter described the technique of the operation in detail, emphasis being laid on the necessity of cutting completely through the mucous and perichondrial coverings in order to insure success in stripping the septum; if this were not done the elevator would be passed between the mucous and perichondrial layers and considerable difficulties would be encountered. The operator should always make sure that enough bone and cartilage had been removed, otherwise the result was likely to be disappointing. Indications of sufficient removal were that the two mucous layers should hang plumb in the mid-line and that the posterior wall of the pharynx should be easily visible. The following advantages were claimed for the operation: (1) the establishment of a free nasal passage obtained with certainty; (2) no general anæsthetic was necessary; and (3) there was rapid healing; no splints or troublesome after-treatment was needed.

Reviews and Notices of Books.

Mind and its Disorders. By W. H. B. STODDART, M.D. Lond., F.R.C.P. Lond. London: H. K. Lewis. 1908. Pp. 488. Price 12*s.* 6*d.*

ON commencing the study of a new text-book or manual one expects the arrangement and the matter of the work to conform to a model which, with modification and improvement, has been the vogue for many years. We feel after a careful perusal of the book now before us that its author has departed from the well-worn paths and is conducting us, after the fashion of a pioneer, by a path he is making for himself. The experiment is a bold one, but we feel that Dr. Stoddart has justified it. The book consists of no mere serving up of other men's work, no mere restatement of old views, and no mere attempt to be up to date by presenting as scientific facts unproved crudities said to emanate from the fertile imaginations of foreign scientists. It is, as we judge it, a careful and cautious statement of normal and morbid psychology made by one who has devoted many years to the study of his subject and who has brought to bear upon that subject an exact observation, a critical scepticism of current theories, and an impartial judgment in which the weight of the evidence of truth alone influences the result.

In his preface Dr. Stoddart explains that his endeavour has been to induce his readers to think of mental processes in terms of neurology, or, to use his own words, "to think neurologically of mental processes." From the point of view of the practical physician he regards the transcendental psychology of modern schoolmen as useless, and so far as he regards it as desirable to touch upon metaphysics he adopts the view that "mind" is not to be contemplated as a thing, but that "mentation" is to be considered as a process having its physical basis in the brain. Sensation is essential to consciousness, and mind with all its higher functions can be evolved from sensation alone. Whether the hylozoistic view that sensation is an attribute of matter is true or not is a metaphysical question the discussion of which the author considers as out of place in his book. Dr. Stoddart develops his thesis as to the physical basis of emotion, suggesting that the cortico-rubral and the rubro-spinal bundles are those which subserve the motor element of emotion. He points out that in birds it is by the cortico-rubro-spinal motor system that all motor impulses are transmitted and that the pyramidal system in them does not exist, and he suggests that in man it is by the former system that the instinctive and emotional motor phenomena are transmitted. The author correlates with this theory the fact that the first tract to suffer in such diseases as general paralysis, alcoholic insanity, and epileptic insanity is the pyramidal tract, with the consequence that motor impulses tend more and more to be transmitted by way of such primitive motor tracts as the cortico-rubro-spinal, and that as a result emotional and instinctive reaction becomes excessive.

With regard to the causation of insanity, Dr. Stoddart lays especial stress upon the fact that nowadays natural selection is allowed no play, with the result that in too many cases the unfittest survive. To quote his words: "The medical man is himself responsible for the increase of disease and the degeneration of the race. The physician who specialises in mental disease is, or should be, a comfort and a blessing to his present patients, but he is a curse to posterity." This arresting statement can be debated, and many qualifications of it suggested or justified, but we feel that Dr. Stoddart has made it out of a desire to tell the truth and not out of an itch for epigram.

In his descriptions of the various forms of psychosis Dr. Stoddart very rightly lays considerable stress upon the abnormal physical signs of each syndrome. Attention to such signs should enable the practitioner to avoid the kind of diagnosis which is far too prevalent and which consists in labelling a condition by its most prominent psychical symptom. It is, however, unlikely that many will subscribe to the author's dictum that the psychical characteristics of melancholia depend upon the physical, especially the motor symptoms, or that the physical condition may be described as one of slight double hemiplegia, or that the combination of an attitude of general flexion and adduction, shallow respiration, constipation, and high blood pressure gives rise to the feelings of depression characteristic of the disease. In an ingenious, but perhaps at the present time somewhat imaginative, explanation of the movement and paralysis of movement which are alleged to be characteristic of depressed and excited states, Dr. Stoddart regards it as probable that in depressed conditions a paralysing product is formed within the cortical neurons and that in mania an irritating product is formed in the same situation, that in agitated melancholia in which there is peripheral activity there is a paralysing product within the cortical neurons and an irritating body in the plasma external to the nerve cell and bathing it, and that in a few cases of mania there is both an irritating body within the cell and also one bathing it externally. The argument is based upon several assumptions. First, that the larger cells in the cortex subserve the larger movements

and the smaller cells the smaller movements, though in fact it well may be that the larger cells subserve the far more complicated and wider range of movements characteristic of the peripheral joints. The second assumption is that the defect lies in the cell and not in its branches, the relative size of which is a highly conjectural matter.

In the less theoretical region of treatment we are wholly at one with the author in his insistence upon the extreme value of rest both in excited and in depressed states, and we trust that the pernicious "rousing treatment," which has been popular in some hands, may receive yet another set-back. In forcible language Dr. Stoddart writes: "It would be as reasonable to treat a case of toxic amblyopia by sending him to view the pictures in the Academy as to treat a case of anergic stupor by sending him holiday-making in the country or globe-trotting." We have, in this book, an illuminating chapter upon Dementia Præcox. We can hardly expect that it will convince the sceptical that such a morbid entity exists, but it will at least present a clear picture of those forms of mental degeneracy which are included under this title. We regret that Dr. Stoddart has included under the heading of Psychasthenia such symptoms as "irrepressible thoughts," "irrepressible fears," and "irresistible impulses." It has always seemed to us that the term "psychasthenia" should be limited to the form of neurasthenia which particularly affects the highest nervous centres, or, in other words, that it should be confined to such cases as exhibit the phenomena of cerebrasthenia. The symptoms which Dr. Stoddart describes in his chapter on psychasthenia are surely more than mere evidence of "asthenia," unless he chooses to apply in a very general way the term "weakness" to any cerebral condition in which there is any mental defect.

This book is one which we cannot help feeling will appeal rather to the advanced morbid psychologist than to the student and practitioner, but nevertheless it is a work which should enable any practitioner to place his cases in certain fairly defined categories and to deal with them accordingly. The work has the outstanding merit of compelling attention and thought, and we wish to congratulate the author heartily upon its exceptional qualities.

Photographic Optics and Colour Photography. By GEORGE LINDSAY JOHNSON, M.A., M.D., B.S. Cantab., F.R.C.S. Eng., Fellow of the Royal Photographic Society, &c. With 14 plates and 170 illustrations. London: Ward and Co. 1909. Pp. 304.

THIS book is an excellent introduction to the study of the optics of photography. Since photography has become the plaything of the public the majority of amateurs are content with the rule-of-thumb instructions which are supplied to them by manufacturers of photographic appliances and by popular hand-books. Fortunately for them they have no desire to rise above mediocrity in their results and they obtain the satisfaction they seek in the admiration of incompetent critics. For the few who wish to rise to higher planes a knowledge of the science of lenses and the properties of light is absolutely essential, and the best results are impossible without it. Dr. Lindsay Johnson has a thorough grasp of the subject and places it before the reader in clear language, though many will be frightened at the mass of mathematical formulæ and deductions which pervade the earlier parts of the work. Yet for these, too, there is much of interest, such as descriptions of the kinematograph, methods of colour photography, the photography of projectiles, and so on. Dr. Lindsay Johnson is a bold man and does not shrink from controverting the oft-quoted opinion of von Helmholtz upon the optical imperfections of the eye. He says: "The eye is the most perfect organ we can conceive of for the purposes for which it is used. Its very imperfections are advantages. It is at once an autochrome camera, a kinematograph producing life-sized coloured pictures in motion, a photometer, a stereoscope, a range-finder, a microscope, and an opera glass; while the whole apparatus is provided with a compound, non-distorting, rectilinear lens, working at F/4 or in some cases at F/3, and provided with a self-adjusting iris diaphragm." The maker of an optical instrument might well feel gratified at such a laudatory advertisement.

Therapeutics of the Circulation. Eight Lectures delivered i the Spring of 1905 in the Physiological Laboratory of the University of London. By Sir LAUDER BRUNTON, Bart., M.D. Edin., D.Sc., LL.D. Edin., LL.D. Aberd., F.R.C.P. Lond., F.R.S. Published under the auspices of the University of London. London: John Murray. 1908. Pp. 272. Price 7*s.* 6*d.* net.

THESE lectures, delivered in 1905 by Sir Lauder Brunton, deal with the fundamental problems of the circulation in health and disease, and are chiefly concerned with the application of the results of experimental research to the elucidation of those problems and to the treatment of disease. The lectures are copiously illustrated by *clichés* of instruments, reproductions of tracings, and numerous explanatory diagrams. The purpose of the lectures as prescribed by the University is "to present the results of recent investigations by the investigators themselves," and Sir Lauder Brunton gives the results of his own numerous researches in the circulatory system and the actions of drugs upon it, while making numerous references to the work of other observers. The general character of the subject matter is elementary rather than profound, and since the lectures are belated in their publication for reasons which are set forth in the preface, although appendices are added giving brief notice to recent work, they can hardly be said to deal with the subject in a very exhaustive manner. They are written in simple language, are clear and interesting, and will serve in a valuable manner to give the student or practitioner a general impression of the fundamental principles upon which treatment in diseases of the circulatory system is based.

In the earlier lectures the general physiology of the heart and blood-vessels is considered, and the question of the origin and conduction of the cardiac contraction is discussed at some length. Sir Lauder Brunton is apparently not a whole-hearted supporter of the myogenic theory of the origin of the cardiac rhythmical contractility and believes that there are two controlling mechanisms, nervous and muscular, and that in certain circumstances these may interfere with one another and produce intermittence or irregularity of the pulse. Considerable attention is devoted to instrumental methods of clinical investigation in cardiac conditions, and the various forms of sphygmomanometers, plethysmographs, and sphygmographs are described and figured. Gibson's clinical polygraph is also described in an appendix, but there is no reference to the instruments or to the results of Dr. J. Mackenzie, which have considerably added to our knowledge of abnormal cardiac conditions.

A subject to which Sir Lauder Brunton attaches considerable importance is what he terms "self-massage of the heart and vessels," by which is meant the beneficial effects exerted upon the circulation of blood and lymph within the walls of the heart and vessels by their own movements. Thus in the case of the heart, its alternate contraction and dilatation within the relatively unyielding pericardium serve to draw blood and lymph into the heart walls and lymph within the pericardial space. In like manner the alternate distension and relaxation of the arterial wall are regarded as serving to draw fresh supplies of blood into

the vasa vasorum. Where nerves run in the same sheath as arteries, they are regarded as sharing in the beneficial effects of this vascular self-massage. Some of the good effects of digitalis, exercise, massage, and inhalation of oxygen are attributed to their promotion of these functions of self-massage. Sir Lauder Brunton refers to some observations of Brücke and of Kronecker and his pupils which lend support to these views, and in his preface, as an apology for the attention given to them, states that he regards them as of practical importance. We must confess that, in spite of their ingenuity and the skill with which the theories are developed, their importance, at any rate in the case of the vessels and nerves, is hardly established.

The most valuable part of these lectures is that dealing with the action of drugs and other measures upon the heart and vascular system. The actions and uses of digitalis and its congeners, of strychnine, caffeine, aconite, and the nitrites are described in the clear and attractive style to which we are accustomed from Sir Lauder Brunton. The accounts given of digitalis and of the nitrites are of especial interest owing to the part which he has played in the elucidation of their modes of action and in the establishment of their usefulness. The last two lectures deal more directly with therapeutics, and useful details are given of the treatment of cardiac diseases and of their associated symptoms. In this connexion such special procedures as the Nauheim treatment and exercises, chloride-free diet, and the use of hypnotics receive consideration. The book contains unusually complete and useful indexes, and should be of great practical utility, as our remarks show, to students and practitioners alike.

Human Speech. By N. C. MACNAMARA, F.R.C.S. Eng. Vol. XCV., International Science Series. With 44 illustrations. London: Kegan Paul, Trench, Trübner, and Co., Limited. 1908. Pp. 284. Price 5*s*.

THE object of this work is to explain the nature and action of the living matter of those parts of our bodies by means of which we gain ideas concerning the external world and are able to express our thoughts in intelligent speech. This probably accounts for the sub-title of this work, "A Study in the Purposive Action of Living Matter," and for the very long series of subjects that are dealt with before the real question of speech is reached. Of the 13 chapters composing the work about nine, or somewhere about 200 pages out of 267 of actual text, are devoted to preliminary subjects before the author deals with Broca's centre of speech.

The best way to give an idea of the large amount of space taken up with preliminary matter is to name only a few of the discursive topics—e.g., the constitution of matter, Ehrlich's side chains, bacteria (aerobic and anaerobic), enzymes, protoplasm, chlorophyll, amœbæ, asexual reproduction, mitosis, germ cells, development of sense-organs in multicellular animals, and sponges. Then there is a chapter on the nervous system of animals from medusoids up to arthropods, which brings us to p. 141. In the next 30 pages we have also a short description of the nervous mechanism of mammals, and in the same chapter (VIII.) about two pages are given to "apparatus by means of which vocal sounds are produced in man and some other animals," with a reference to "Elementary Lessons in Physiology" by Huxley. Reflex action and distance receptors, neurons and effector organs all receive notice in a necessarily crowded manner, and the conclusion is reached that "living matter of the nervous system of the existing predominant orders of animals has been moulded into harmony with its environment, principally by the action exercised on it through energy received from its distance receptors." The well-known experiments on removal of the brain in pigeons by Schrader and of that in dogs by Goltz are set forth, while to the basal ganglia of birds from their great size is ascribed the power which these animals possess of imitating vocal and other sounds. Then follows a general account of aphasia from the days of Broca onwards. Paraphasia, alalia, and other interesting phenomena are omitted, as, no doubt purposely, are the mechanisms of the production of vowels and consonants—important factors in speech. The anthropoid brain and that of man and of the microcephalic idiot are compared as bearing on the question that imperfect development of speech centre and psychical cerebral area leads to incapacity to reason, and in the last chapter there are a short statement of the reaction of speech upon brain, and an account of Laura Bridgeman and Helen Keller. The author concludes with a summary of the course of evolution of intelligent speech from movements of unicellular animals and debates how the elements constituting "consciousness-matter" have become differentiated, adding an application of his views to the training of young children.

The work is interesting but very discursive; and, having regard to its main title, it would have been better to devote a larger part to the main subject—viz., human speech.

Principles and Practice of Physical Diagnosis. By JOHN C. DACOSTA, jun., M.D., Chief of Medical Clinic and Assistant Visiting Physician, Jefferson Hospital, Philadelphia. With 212 original illustrations. London and Philadelphia: W. B. Saunders Company. 1908. Pp. 548. Price 15*s*. net.

THE purpose of this book, as stated in the preface, is to present within reasonable compass the principles of physical diagnosis and to apply this means of research to the study of thoracic diseases. To meet the requirements of junior students especial consideration is rightly given to clinical anatomy and to the origin, mechanism, and meaning of normal physical signs; these points must be thoroughly understood before pathological indications can be correctly and fully appreciated. In order to guide those farther advanced in the study and practice of medicine the subjects of pathology and diagnosis are accorded commensurate prominence.

The first section is devoted to a consideration of the methods and "technic" of physical examination. The theory and practice of the simpler direct methods of physical examination are explained in detail. As a whole, the descriptions of the various measures adopted are full and lucid, and although it is difficult to teach physical examination otherwise than by actual demonstration at the bedside or in the out-patient room, nevertheless the student may derive much information and help by referring to a text-book of this nature. The use of apparatus for estimating blood-pressure is described and directions are also given of the sphygmocardiograph and sphygmograph. The several types of the tuberculin reaction are included in this section. The opinion is expressed that the cutaneous tuberculin test of von Pirquet is of little practical value in diagnosing tuberculosis in the adult, since positive reactions appear to be the rule in those who have passed the age of puberty, despite the fact that the subject is symptomatically free from all tuberculous taint. This fact would tend to support the contention urged by some observers that few individuals reach this period of life without having been at some time infected with Koch's bacillus. In children the test is said to be more useful and its value increases in direct relation with the age of the child.

The sections devoted to the examination of the thorax and of the broncho-pulmonary system are admirably arranged. The description of the adventitious sounds which may be

heard over the chest is clear and accurate, but the terminology is not exactly the same as that generally employed in this country. Nevertheless, by carefully studying the remarks on the physical examination of the lungs the student will learn much that will be useful to him. Section IV. is occupied with a discussion of the physical signs met with in the various diseases of the lungs. The examination of the cardio-vascular system is equally well described. The adventitious sounds which may be heard over the cardiac area are clearly indicated and their mechanism is discussed in an able and interesting manner. The phenomena dependent on lesions of the valves of the heart receive detailed attention. The remarks on compensation are worthy of notice. Stress is laid on the point that perfect compensation continues so long as the nutrition of the myocardium is sufficient to allow the development of hypertrophy adequate to maintain a normal cardio-vascular equilibrium, and at this stage of a valvular disease the cardiac physical signs are the sole evidences of the lesion to be detected. Ruptured or broken compensation supervenes when the nutrition and reserve force of the heart fail to keep pace with the strain imposed by the valvular lesion, so that the circulatory balance becomes disturbed and the stasis aggravated. It is a change referable to myocardial enfeeblement, and ultimate dilatation of the heart develops, either gradually or abruptly, when the nutrition of the heart becomes so impaired that this muscle relaxes under the stress which hitherto it has been able to bear, and hence the total available cardiac force is inadequate for the maintenance of the normal circulatory balance. The section devoted to the examination of the abdomen and abdominal viscera is as full and descriptive as are the previous ones, and contains many useful hints as to the detection of disease of the stomach and other organs.

The book is copiously illustrated. We take exception, however, to the class of nude figure which is so freely made use of for the teaching of physical signs; the usual anatomical diagrams would have served the purpose equally well.

LIBRARY TABLE.

The Frontiersman's Pocket Book. Compiled and edited by ROGER POCOCK. London: John Murray. 1909. Pp. 455. Price 5*s.* net.—In the second book of Esdras, Chapter IV., is a remarkable passage in which Esdras asks an angel why so many troubles had come upon the chosen people. Thereupon the angel answered and told Esdras that if he would answer him three questions he would explain the judgments of the Almighty. On Esdras being unable to answer the questions the angel said: "Now have I asked thee but only of the fire and wind and of the day wherethrough thou hast passed, and of things from which thou canst not be separated, and yet canst thou give me no answer of them. Thine own things and such as are grown up with thee canst thou not know." The frontiersman's pocket book is drawn up to explain and to train men in understanding such things as are grown up with them. Modern civilisation tends to destroy almost entirely a man's individuality and his powers of depending upon himself. If he is set down in a wild country he is altogether helpless. Such simple matters as finding his way, the making of a fire without matches, the very simplest reading of the stars are a sealed book. Literature is full of examples of this. Even so careful a writer as Thackeray describes a voyage down the Thames with the sun setting in the west and the *horned* moon shining over Margate—i.e., in the east. And this about 8.30 P.M. And not many years ago a popular romance appeared in which the author not only described a total eclipse of the sun as occurring on the next day but one after the full moon, but also made it last for over an hour. The Pocket Book gives the learner information about such matters as finding the way, how to make a camp, how to get food and water, signalling, scouting, knots, boats, hygiene of camps, and the many other matters which are almost necessary for existence in the case of anyone leaving behind him the vast resources which shelter man in highly civilized places. The most important section of the book from our point of view is that on "Medical and Surgical Treatment when no Doctor can be obtained." The notes are excellent and, guided by them, as far as an untrained person can make a diagnosis, they will enable him to do so. Under the heading of Foreign Bodies in the Eye we see that directions are given for turning up the upper eyelid. This is by no means an easy thing for an untrained hand to do, and we would suggest that if it is at hand a drop of glycerin in the eye should be tried. It hurts, but it causes an abundant flow of tears which may wash out the irritating substance. We recommend this book to anyone who lives in the country, whether he may be going to serve as a frontiersman or not; the better he understands it the more sure he will be to seek medical advice when it is necessary, while the general matter of its pages will widen his vision.

Herbert Fry's Royal Guide to the London Charities. London: Chatto and Windus. 1909. Pp. 294. Price 1*s.* 6*d.*—This excellent little guide contains particulars of all the London charities, giving such information as the name, the date of foundation, the address, the objects, the annual income, and the chief officials. Like nearly all charitable guides, it contains details of certain sectarian associations which have no right to the name of charity. The editor, Mr. John Lane, contributes an interesting preface, and altogether the book will be found of great use to those kindly inclined people who may be doubtful, among the multiplicity of charitable organisations, how to decide upon the allocation of their alms.

JOURNALS AND MAGAZINES.

The Biochemical Journal. Edited by BENJAMIN MOORE, D.Sc., and EDWARD WHITLEY, M.A. Vol. IV., Nos. 1 and 2. Feb. 8th, 1909. Biochemical Laboratories, University of Liverpool.—The contents of these numbers of the *Biochemical Journal* are: 1. Observations in Certain Marine Organisms of (*a*) Variations in Reaction to Light and (*b*) a Diurnal Periodicity of Phosphorescence, by Benjamin Moore, M.A., D.Sc., Johnston professor of biochemistry, University of Liverpool. 2. The Relative Importance of Inorganic Kations, especially those of Sodium and Calcium, in the Causation of Gout and Production of Gouty Deposits, by William Gordon Little, M.A. Aberd., M.D. Edin. 3. Of the Nitrogen-containing Radicle of Lecithin and other Phosphatides, by Hugh MacClean, M.D., Carnegie Research Fellow. 4. Some Observations on the Hæmolysis of Blood by Hyposmotic and Hyperosmotic Solutions of Sodium Chloride, by U. N. Brahmachari, M.A., M.D., lecturer on medicine at the Campbell Medical School, Calcutta. 5. Further Observations on the Action of Muscarin and Pilocarpin on the Heart, by Hugh MacClean, M.D. 6. The Occurrence and Distribution of Cholesterol and Allied Bodies in the Animal Kingdom, by Charles Dorée, M.A., B.Sc., Lindley student of the University of London.

THE ROYAL SANITARY INSTITUTE.—A sessional meeting of the institute will be held at the Parkes Museum, Margaret-street, W., on Wednesday, April 7th, at 8 P.M., when a discussion will be opened by Mr. W. D. Scott-Monscrieff on River Pollution—its Ethics, Æsthetics, and Hygiene. The chair will be taken at 8 P.M. by Sir Francis Sharp Powell, Bart., M.P., vice-president of the institute. Tickets for admission of visitors may be had on application to the secretary.

New Inventions.

KNEE SUPPORT.

I HAVE long felt the need of an apparatus which will keep the knee well flexed and rotated during the operation for the removal of a loose cartilage of the knee-joint. It is usual to employ an assistant for this purpose, but to keep the knee flexed and rotated for any length is extremely tiring, and consequently, after a little while, the assistant's hands become unsteady and the knee of the patient tends to shake. To obviate this Messrs. Weiss have made for me the support shown in the accompanying illustration. It consists of a moveable leg-rest working on a rachet which enables it to be extended or flexed as required. On either side of the leg-rest are handles to which the leg is bound by a bandage rotating the knee inwards in case of removal of the external cartilage and outwards in case of the internal. At the back of the apparatus is a moveable support for the leg-piece.

By means of this support the leg-piece is raised or lowered according to the length of the thigh and is fixed to the required height by means of a fixation screw. The support can be lowered till it is in the same plane as the rachet frame, but it cannot be raised beyond a right angle. It has been found that greater play than this is not required and tends to lessen the stability of the apparatus. To use the apparatus the limb is placed on the splint in the extended position, and is then flexed by adjusting the leg-rest and the vertical support. The leg is rotated inwards or outwards as required. Before the sutures are inserted in the capsule the fixation bandage is removed and the leg-piece is extended so as to relax the capsule. In my own practice I have found the apparatus of the greatest use, and I hope it may be so to others. I may say in conclusion that I have received the greatest assistance from Lieutenant and Quartermaster F. Bruce, R.A.M.C., who made my original model and helped me with many practical suggestions.

F. E. GUNTER, Major, R.A.M.C.

MEDICINE AND THE LAW.

The Liability of Employers for Accidents to Employees.

A PAPER summarising and criticising the law of employers liability was read at the meeting of the Law Society held at Birmingham during last October and has now been reprinted in pamphlet form. The author, Sir John Gray Hill, an ex-President of the Incorporated Law Society, has gained his practical experience of the working of recent legislation as solicitor to associations of shipowners, and he frankly admits that his personal view may therefore not coincide with that of those whose approach to the subject has been made from the other side. In his criticism of the policy and general effect of the various Acts dealing with "employers' liability" and "workmen's compensation," however, he writes temperately and with fairness, admitting the necessity for improving the workman's position as it was before or even after the Employers' Liability Act, 1880, but questioning the justice and the wisdom of exposing either employers of all kinds to the almost unlimited risks against which they now have to insure themselves, or workmen and other employed persons to the temptation to malinger and deceive. The extension of the meaning of the word "accident" referred to recently in THE LANCET[1] is illustrated by Sir John Hill by the case of the destitute person who was allowed to work his way home from America as stoker on board a liner and succumbed to heat-stroke in the stokehold, earning thereby compensation for his widow.[2] The widening of the meaning of "accident" by statute and judicial decision, the extension of the benefit of "workmen's compensation" by the Act of 1906, and the reduction to one week of the period of incapacity for which compensation cannot be obtained, have enormously increased the extent to which the medical profession is interested in the claims made against employers on account of accidents, real or alleged, and a considerable portion of the pamphlet under criticism relates to matters more or less directly concerning medical men. Prominent among these is the author's suggestion that, in view of the conflicting medical evidence constantly adduced upon such obscure points as the amount and probable future duration of incapacity for work, there should be medical assessors appointed to assist county court judges, and that these should be men of eminence in their profession whose reward should be proportionate to the qualifications necessary for such a post. Sir John Hill cites with regard to the malingering workman the words of Professor R. J. Pye-Smith spoken at the meeting of the British Medical Association in July, 1908, when he said: "Instead of honestly trying to get back to work as soon as possible, thus proving their manly independence and retaining their self-respect, the injured workmen, in too many instances, try to persuade themselves and their medical examiners that they are incapacitated for work long after their condition justified such a contention"; and he also quotes from the letter of a gentleman whom he describes as the senior physician to one of the great Liverpool hospitals: "From our experience the Act has in general exercised a decidedly demoralising effect on workmen, especially on those who are as a rule disinclined to steady labour. We are pestered with friends making the most ridiculous claims for compensation where no grounds exist." He also comments upon the injustice which arises when an injured workman refuses, and cannot be compelled, to submit to a surgical operation which will diminish his incapacity and which would entail no great risk or suffering. As to this, he proposes that the law should be amended so that an injured workman's allowance may be stopped until he undergoes an operation which may be found to be desirable, and which "involves no risk to life and is of such a nature that a reasonable man not in receipt of a weekly payment would undergo it." It is difficult for any fair-minded person to disapprove of such a suggestion, particularly when he reflects that a workman in such a case may give up his claim for a weekly payment, taking in lieu of it a lump sum as compensation for "permanent incapacity," and that nothing need then prevent him (after he has duly invested or dissipated the money) from going into a hospital and having had the operation successfully performed at the expense of a charitable institution, from resuming work at a wage equal to that which he earned before his accident. It should be mentioned that Sir John Hill calls attention to an alleged practice on the part of speculative solicitors of agreeing with medical men who are willing to accept such terms, that the latter shall receive remuneration in respect of evidence to be given on behalf of a claimant only in the event of the award being in his favour. If there be any medical men who work under conditions such as these it need hardly be said that, if they should be detected in doing so, their position as witnesses will not be pleasant, and that they will deserve no sympathy should they suffer seriously for their imprudence.

[1] See THE LANCET, March 13th, 1909, p. 779
[2] See THE LANCET, Jan. 11th, 1908, p. 123.

THE LANCET.

LONDON: SATURDAY, MARCH 20, 1909.

To Hasten the Decline of Tuberculosis.

ALTHOUGH tuberculosis in England and Wales has, when measured by its recorded death-rate, steadily declined for very many years past, and although there may be prospect of such decline continuing until the malady is as extinct in this country as leprosy, the harm which it works through death, infirmity, and poverty is still terribly far-reaching. Therefore, if we can be satisfied that even by enormous expenditure the disease could be made to wane at a materially greater pace than heretofore, every right-minded person would do his best to promote this desired end. Bearing upon this problem there have recently been published two official papers—one the report of the British delegates to the Washington Congress, the other a memorandum by the medical officer of the English Local Government Board, which is intended to supplement the Public Health (Tuberculosis) Regulations, 1908. The report of the delegates was summarised in our last issue, and we then pointed out that the "omnibus" resolution, which was adopted at the close of the Congress and which is reproduced in the report of the delegates, was passed in circumstances which did not allow as much discussion as is desirable if resolutions are to bear the weight which they are intended to carry. We are afraid this is often the case at congresses, and those who know how persistent persons are able to get resolutions carried through, either by the indifference, good nature, or perhaps absence of those who do not agree with them, will not be inclined to attach much scientific value to congress resolutions. We are not here referring generally to the Washington resolution, but the above comments have perhaps some application to that section of the resolution which proposes to deal with the relation of bovine to human tuberculosis.

This section was worded as follows: "That preventive measures be continued against bovine tuberculosis, and that the possibility of the propagation of this to man be recognised." This very lukewarm statement is so out of harmony with the definite pronouncement of our own Royal Commission that we feel compelled to draw attention to it in justice to the admirable scientific work of our own country, and we may say that we know of no scientific work which justifies this portion of the Washington resolution. In the view of the Royal Commission, and on the basis of its elaborate researches, "a very considerable amount of disease and loss of life, especially among the young, must be attributed to the consumption of cow's milk containing tubercle bacilli." Having regard to the recent work which has been carried out, and which raises the question whether a considerable amount of pulmonary tuberculosis may not be of intestinal origin, this "possibility" resolution on the part of the Congress was quite unfortunate, and we look forward curiously to the verbatim report of the proceedings at which this part of the resolution was prepared for the plenary meeting. With much of the rest of the "omnibus" resolution we are at one. Perhaps the section of the resolution upon which the delegates lay most stress in their report is that which relates to the compulsory notification of cases of pulmonary tuberculosis, and they are evidently in favour of an extension of the system. They point out that in the light of experience the objections to compulsory notification are rapidly disappearing. This is no doubt true, and it is due in large part, in so far as England and Wales are concerned, to the statesmanlike policy of the Local Government Board in preventing tuberculosis from being grouped and regarded as an acute infectious disease. The delegates of the British Government to the Washington Congress lay stress in their report[1] upon the importance of coördination between public and charitable organisations, and all will, we think, agree as to the desirability of making more use in this country of the several organisations which already exist. It may not be always practicable or desirable to institute tuberculous dispensaries such as are so common in France and elsewhere, but it is an easier matter to adapt existing dispensaries to the necessity of the situation. In this direction the British delegates are hopeful of the results of action on the lines embodied in the "omnibus" resolution, in which organised action against tuberculosis on the part of all Governments is urged, and they look forward to a much more rapid decline than in the past in the mortality caused by the disease. We sincerely trust that experience may not prove this prophecy to have been too optimistic, but we have misgivings, from a study of the results already attained in certain places here and elsewhere, lest the experience of the next 20 years may delete the word "much."

We come to the recent memorandum drawn up by the medical officer of the English Local Government Board. This is intended primarily for the use of Poor-law medical officers who are now required to notify cases of tuberculosis coming under their care. But, as the medical officer rightly observes, persons may be under the Poor-law to-day and outside its influence to-morrow, and yet still be as much in need of advice as they were before. As a consequence the scope of the document has been extended so as to be applicable to all cases. The general trend of the memorandum is one which we cordially welcome, because many points—not all—for which we have contended in THE LANCET for many years are fully accepted. For example, the absolute necessity is urged of differentiating between the acute infectious diseases and tuberculosis in the matter of infectivity, and the fact is emphasised that the infectivity of the latter is low and not improbably only operative under certain conditions of deprivation, overcrowding, or other eminently unwholesome circumstances. If these truths are not remembered the social

[1] THE LANCET, March 13th, 1909, p. 786.

disturbances following upon the notification of tuberculosis may be serious. It is difficult to determine the cause of this low infectivity of tuberculosis, but it may perhaps be more a question of the resistance of the body to the multiple invasions of the bacilli than of any low virulence on the part of the organisms themselves; or it may, of course, imply that prolonged exposure—i.e., a heavy dose—is necessary, and such a dose is perhaps more likely to be taken with milk than by inhalation. But some of the experiments carried out by the Royal Commission do not wholly support that view. The emphasis laid in the memorandum upon the importance of doing nothing which will deter the patient from following his occupation is excellent. "Above all," it says, "the investigation must not pursue inquiries in a manner, or give information, that may prevent a consumptive patient from continuing to earn his livelihood." The memorandum also strikes a wholesome note in the matter of expenditure. The cost of some of our existing sanatoriums has undoubtedly acted as an inhibiting factor to many local authorities anxious to do something for the tuberculous sick, but who did not feel justified in doing it at a cost of from £500 to £1000 a bed. As the result of all the steps proposed the medical officer of the Local Government Board looks forward to a quicker decline in the death-rate from tuberculosis than has hitherto been experienced, although, he adds, "results cannot be measured with accuracy except after the lapse of a considerable number of years." This, like the whole of the memorandum, is reasonable and moderate, and we shall all be scanning the death-rate figures of places where precautions have already been taken to detect the first indications of the increasing velocity of fall. As we said when noticing the regulations themselves, their successful application will depend upon the tact and discretion of our medical officers of health. In a last word we must call attention to one aspect of the memorandum, which for all we know may have escaped the author's notice. It is, so far as we are aware, the first official document which—perhaps without knowing it—foreshadows a fusion between preventive medicine and sick relief, and we imagine, if we are right in our surmise, that this aspect of the memorandum will be pleasant reading to certain members of the Royal Commission on the Poor-law.

Bacteriology Tested by Epidemiology.

EVERY theory should be tested occasionally to see if it is still capable of explaining all the observed phenomena. When the theory was first formed it may have accounted for all the facts then known, but in the years that have passed many new facts will have been recorded, and these must be used as touchstones to test the validity of the standing theory. In fact, there can hardly be a stronger proof of the truth of a theory than its capability of accounting satisfactorily for facts and phenomena unknown and unobserved when the theory was first formed. The bacterial theory of infectious diseases has been held unchallenged for many years, and though it has not been upset yet it must be acknowledged that there are certain facts for which the theory does not account fully; and Dr. W. H. HAMER has done good service to the systematic study of disease by reading a paper on Bacteriology in Relation to Epidemiology before the Pathological Section of the Royal Society of Medicine.

The relations which should subsist between bacteria and the diseases attributed to them were first defined by KOCH, and with slight modifications KOCH'S postulates still hold good, speaking generally. They are that the organism must always be discoverable in cases of the disease and not in other diseases or in health; that it can be cultivated for many generations outside the body; that when injected into another animal it will cause the disease; and that it is then to be found in this animal. It must be acknowledged that all these postulates are complied with very rarely indeed, if ever. It is not at all rare to fail to find the causal organism in an individual case of disease, and the explanation usually given is that the search has not been as yet sufficiently thorough. Again, many organisms which are considered to be causal are frequently to be found in healthy persons. The organisms of enteric fever, of cholera, and of diphtheria may be cited as examples of this, and to explain these facts we have to invoke the idea of healthy "carriers" of disease. When a causal organism is injected into an animal, often it happens that it gives rise to a disease bearing no clinical resemblance to the original malady. When the pneumococcus, isolated from a typical case of pneumonia, is injected into an animal, such as a rabbit, it will produce, not a pneumonia, but a general septicæmia, and this even if the injection is made into the lung itself. Thus we cannot rely on KOCH'S postulates as a decisive test of a causal organism. It is, however, in epidemiology that Dr. HAMER has found the greatest difficulty in accepting without qualification the ordinary explanation of the relation between bacteria and disease. When passing in review the epidemics of successive epochs striking evidence of persistency of disease types is discoverable, but differences have again and again been detected in the germs found in association with individual outbreaks, and there is a natural tendency to consider that these differences have a specific value. Recent work on cerebro-spinal meningitis seems to show, if regard be paid to the distinctions drawn between Gram-negative and Gram-variable cocci and to the differences observed with the agglutination and fermentation tests, that many different organisms, or at least different "strains" of organism, are producing the disease in different parts of the world. A further difficulty is found in the profuse diffusion of "causal organisms" without a corresponding production of disease. The bacillus tuberculosis is widely distributed in milk, butter, and meat, and it is therefore consumed almost daily by everyone. It is discharged in enormous numbers daily by nearly all tuberculous cases, yet the disease is not correspondingly prevalent. Again, typhoid carriers may harbour the germs for many years, yet it appears to be only occasionally that the disease is spread. In diphtheria and enteric fever the "causal organisms" are widely distributed among healthy persons. Lastly, the germ theory in its ordinary form does

not afford a wholly satisfactory explanation of the close relation between certain diseases, such as scarlet fever and diphtheria on the one hand and typhus and relapsing fever on the other.

The question then naturally arises: Are these so-called causal organisms truly causal, or are they only "secondary invaders"? They may perhaps be normal inhabitants of the body, only assuming importance in disease. The swine fever bacillus is generally a normal inhabitant of the pig's intestine, and it is now known that the actual virus of swine fever is a "filter passer"—i.e., it can pass through porcelain filters; further, it has been found that though the disease itself, and that produced by injection of infected blood, are infectious from animal to animal, the disease induced by inoculations of cultures of the swine fever bacillus is not thus infectious. Dr. HAMER quoted many other instances to show that the "causal organism" is not capable by itself of inducing disease and that a "*tertium quid*" must be assumed. Several solutions of the difficulty suggest themselves. The most obvious is that the resistant power of the body is the factor which is accountable for the apparently varying infectivity of "causal organisms," and this was the view which commended itself to the greater part of those who joined in the discussion on Dr. HAMER'S paper. The very numerous and complex mechanisms of protection which research has shown to exist must have a very great influence on the infectivity of pathogenic organisms, and there is little doubt that this explanation solves satisfactorily many of the difficulties which have been mentioned, but not all. Another solution is that the pathogenicity of a bacillus may vary. It has long been known that a microbe can lose part or the whole of its pathogenicity, but it is now equally certain that its pathogenicity may be increased, and that even organisms normally harmless may become virulently pathogenic. Thus some diseases may be regarded as not so much the direct effect of a pathogenic organism as the acquirement of pathogenicity by non-pathogenic organisms. How this alteration of character of an organism is brought about is another matter. Dr. HAMER suggests that the bacillus may become united to an "activator" or "enzyme," but he does not say definitely what he considers this activator to be, though he points out that it may be possibly a chemical substance. A point strongly in favour of some third factor is to be found in the fact that as a rule emulsions prepared by grinding up some of the tissues or organs of an infected animal are far more virulent than cultures containing approximately an equal number of bacilli. For instance, in the ox the smallest fatal dose of a culture contained some 20,000 million of tubercle bacilli, while the smallest effective dose of emulsion prepared from the tissues of an infected animal contained only 5500 bacilli. There is evidently some other factor which has to account for the greater activity of the emulsion containing portions of tissue in addition to the bacilli, but as to what this factor is there will be many opinions. Probably the majority of bacteriologists will consider that the third factor is susceptibility, and this is undoubtedly a very important element in the production of infectious disease, but the variability of the pathogenicity of the microbe must also be accepted. To what this variability is due is another point; the superior potency of emulsions may be due to the fact that the microbe must have a *milieu* in which it can best display its powers, and Dr. HAMER'S suggestion of an "enzyme" may mean little beyond this. Whatever may be the outcome of the discussion, we think that Dr. HAMER is to be thanked for having drawn attention to some epidemiological difficulties which have been felt by many others, though not fully expressed.

The New Poisons and Pharmacy Act.

THE Poisons and Pharmacy Act which received the Royal Assent towards the end of last year and comes into force on April 1st, is chiefly remarkable for the fact that it brings to an end the long-standing strife in which the combatants have been, on one side, legally qualified chemists and druggists, and on the other, joint-stock companies trading as chemists and using the statutory titles. Being the outcome of a compromise between conflicting interests, it is also remarkable in affording, apparently, considerable satisfaction to both the parties affected, and at the same time insuring for the public—a factor which is often overlooked when the interests of two specific classes are at stake—an improved pharmaceutical service and a better means of distinguishing between a place of business owned by a qualified person and a branch shop owned by a company. The main purpose of the Bill as introduced into Parliament, as a Government measure, was not, however, to deal with the company difficulty, but to make provision for the sale by persons, other than qualified chemists, of poisonous compounds used in agriculture and horticulture, that part of the measure affecting practice by companies being inserted subsequently. The principle underlying the Act of 1868 was that the surest method practicable of safeguarding the public against the misuse of poisons was by the education of the poison seller. From this principle the new Act departs in respect of two very dangerous poisons—namely, arsenic and nicotine—and it is a matter for regret that the legislature should have deemed it necessary to extend the facilities for obtaining these substances. A Departmental Committee appointed for the purpose of inquiring into the sale of poisons, after hearing evidence, arrived at the conclusion that the fact that sheep-dips, insecticides, and weed-killers containing arsenic and nicotine could only be procured from the shops of registered chemists caused inconvenience to those engaged in agricultural and horticultural pursuits and recommended that further facilities for procuring these substances should be provided. The new Act embodies a provision, framed upon this recommendation, empowering local authorities to license persons other than legally qualified chemists to sell "poisonous substances to be used exclusively in agriculture or horticulture for the destruction of insects, fungi, or bacteria, or as sheep-dips, or weed-killers, which are poisonous by reason of their containing arsenic, tobacco, or the alkaloids of tobacco." Local authorities are required before granting licences to take into consideration whether, in the neighbourhood where the applicant for the licence intends to carry on business, the reasonable requirements with respect to the purchase

of such poisonous substances are satisfied, and it may be hoped that the local authorities will recognise the seriousness of the new duty intrusted to them and that they will earnestly consider all the circumstances before giving authority to an untrained person to traffic in such potent substances as nicotine and arsenic.

The Privy Council is empowered to add other poisons to those which may be sold by licensed dealers for the specific purposes named. Excepting the provision just referred to, the Act does not depart from the principle of the educated vendor, but, on the contrary, places the poison schedule on a more rational basis and extends it materially. Safeguards have also been provided for in connexion with the sale of the mineral acids and the soluble salts of oxalic acid (without restricting their sale to any special class of trader), these consisting in the labelling of the vessels containing these with the word "poisonous" and with the name and address of the seller. Seeing that during the last ten years over 600 deaths have been caused by hydrochloric acid, it is unfortunate that more stringent regulations have not been made as to the sale of it. We must come, however, to the important question of legal titles. The Act of 1868 not only restricted the sale of scheduled poisons to registered persons, but it also made it unlawful for non-registered persons to keep open shop for the sale of poison, or to use the title of chemist and druggist, or chemist, or druggist, or pharmaceutical chemist, or pharmaceutist, or pharmacist, the three last-named titles being reserved to those who had passed the major examination of the Pharmaceutical Society of Great Britain. It was shown by a judicial decision of the House of Lords in 1880 in the case of the Pharmaceutical Society of Great Britain *v.* The London and Provincial Supply Association, Limited, that joint-stock companies were not persons within the meaning of the Act, and that a company could not, therefore, be brought within liability of penalties for contravention of those sections of the Act which made it unlawful for any unqualified person to sell or keep open shop for the sale of poisons, to use the statutory titles, or to fail to comply with the poisons regulations framed by the Pharmaceutical Society, the administrative authority under the Act. Subsequent to that judgment considerably over 1000 companies have been formed, among the objects of which is that of carrying on the business of chemists and druggists. In many instances such companies have been formed by persons who, having failed to pass the qualifying examination, have taken shelter under the Joint Stock Companies Acts in order to avoid the disabilities and penalties imposed on individuals by the Pharmacy Act. Until the Poisons and Pharmacy Act, 1908, all attempts made by the Pharmaceutical Society to bring companies within the scope of pharmacy law had been abortive, and even the new Act does not recognise the sole right of the qualified individual to the title of "chemist and druggist." While these efforts to bring companies within the scope of the Pharmacy Act were being made the position of pharmaceutical companies was strengthening considerably, and large sums of money were being invested in these concerns. As the political influence of the companies increased the chances of legitimate chemists obtaining what they desired became less and less, and recognising this to be the case, they modified their demands and relinquished their claim to the sole right to use the title of chemist and druggist, but insisted that in other respects companies should be required to fulfil the same legal obligations as individuals. Legislation thus became possible.

The company section of the new Act provides that a body corporate, or in Scotland a firm or partnership, may carry on the business of chemist and druggist if the business—so far as it relates to the keeping, retailing, and dispensing of poisons—is under the control and management of a superintendent who is a duly registered person. The superintendent may only act for one company, and his name must be forwarded to the registrar of the Pharmaceutical Society. In all premises where the business is carried on, if it is not personally conducted by the superintendent it must be *bonâ-fide* conducted, under his direction, by a manager or assistant who is a registered person, and whose certificate of qualification must be exhibited in the shop. The section further provides that the company may use the title of chemist and druggist, or of chemist, or of druggist, or of dispensing chemist only on condition that the superintendent is a member of the governing board of the company. It will be observed that pharmaceutical chemists have been compelled to relinquish their claim to the sole use of the best known of the statutory titles. A very important provision has, however, been made, by means of which the public will be enabled to recognise a qualified individual by his title. Hitherto the ordinary qualified chemist has not been entitled to the statutory designation of "pharmacist," which has been reserved to persons who have passed the major examination. Under the new Act all registered persons may use this title, but not companies. It is therefore probable that the word "pharmacist" will in course of time replace the word "chemist," except in the case of shops owned by companies.

Annotations.

"Ne quid nimis."

IONS IN MEDICINE.

THE theory of ions, as was shown in a suggestive article by Dr. N. S. Finzi, which was published in our issue of last week, is rapidly gaining an interesting and valuable application in therapeutics. The pioneer work in this direction is due largely to the investigations of Professor Stephane Leduc in France and Dr. H. Lewis Jones in this country, and there are those who believe that the method of treatment with ions as it is further studied will prove a powerful agency against disease. Faraday invented the word ion—i.e., traveller—applying it to those constituents of solutions which are set free at the electrodes under the influence of the electric current, the solution which conducts the current being called the electrolyte. Dr. Lewis Jones has used the following simple and amusing illustration of an electrolytic solution when the current is passing. He compares an electrolytic solution with a ball-room containing dancers in couples, who represent the neutral molecules, and a certain number of isolated ladies and gentlemen who represent the dissociated ions.

At one end of the room there is a large mirror and at the other a buffet, and the ladies make their way to the mirror while the men go to the buffet, and the dancing partners separate to follow the movement, the room then presents the picture of an electrolytic solution at the moment when the current is passing. A solution of a salt amounts to a resolution of that salt into two particles, one positive and the other negative in character. The basic group carries a positive charge and the acid group a negative charge of electricity. These particles are the ions. They may be simple or complex particles. In an electrolytic solution of common salt the ions are simply sodium and chlorine, the negative ions, chlorine, being called anions, and the positive ions, sodium, kations. The solution consists of neutral molecules and molecules split into negative ions, anions, and positive ions, or kations. When the acid radi contains more than one element as in sulphate of copper, then the ions in the electrolytic solution are copper, the kation, and SO_4 the anion. The chemical actions, and consequently the toxic, antiseptic, and therapeutic actions, of electrolytic substances are almost exclusively the actions of their ions, and the grouping of the ions determines definite physiological action. Phosphates and phosphides (the former non-poisonous and the latter highly poisonous), though containing the same negative element, act very differently, because in the first case the phosphorus ion is complex (PO_4), while in the second it is simple (P). Arsenic and mercury again are, relatively speaking, non-toxic in the form of complex salts, such as the cacodylates, atoxyl, and so forth, because the arsenic and mercury exist in a complex ion, instead of, as in the case of the arsenites or mercurials, in a simple ion in which the identity of the metal is not lost. Medical ionisation, kataphoresis, or iontophoresis are the terms used to imply the introduction of ions of different sorts into the tissues of the human body, the body itself being regarded, in the words of Dr. Finzi, "as a porous bag of saline solutions containing many ions." It is only necessary to apply pads, soaked in a solution of the medicament and attached to the electrodes of a battery, to the body when the introduction of a therapeutically active group or ion is obtained under easy control. Thus may local anæsthesia be induced by using cocaine hydrochloride on the positive pole and salt solution on the negative. Rodent ulcer may be similarly treated with zinc ions, neuralgia with the salicylic ion, ringworm with the copper ion, warts with the magnesium ion, and so forth. It is remarkable that the dissociation of combined elements and the formation of ions or unattached atoms are brought about not only by electricity but by heat, light, chemical action, x rays, and radium, so that it is possible that radium owes its efficacy to its power of ionising complexes.

OUR BLEACHED DAILY BREAD.

THERE is reason for believing that the practice of bleaching flour to suit the eye of the uninstructed public is largely on the increase. It may be at once stated that the whiteness of bread is not symbolical of its purity and that when this whiteness is almost spotless a suspicion that bleaching chemicals have been used with the flour may fairly be entertained. It would be well if this false criterion of whiteness were disestablished and a return made to the old and sensible preference for a bread retaining the natural slightly brown colour of the ground wheat berry, a colour which is probably significant of a palatable, nutritious, and digestible loaf. It cannot surely be advanced that the treatment of flour with chemicals improves its qualities as regards its suitability for human needs. The chemical itself may be innocuous, but that it has a powerful action upon certain constituents of the bread is evident from the fact that the colouring matters of the flour are bleached. Bleaching, in fact, commonly implies a strong chemical action. It is important therefore to determine whether the action of a chemical which bleaches the colour of a flour does not also unfavourably affect the nutritive constituents of that flour. At all events, it is well known that chlorine renders protein-stuffs insoluble, and that being the case their digestibility is not likely to be improved by chlorine treatment. The favourite bleaching agent, however, appears to be nitrous acid fumes. Medical men need not be reminded of the powerful physiological effect of the nitrites, and, indeed, it is doubtful whether any group of agents in the materia medica show such an intense action on the circulation as does this class of drugs. It may be urged, however, that although nitrous acid is used for bleaching the flour, yet all trace of it would be removed when the flour was cooked, and that not a particle could persist in the finished loaf. If we accept this the question remains as to how far the food value of the loaf is depreciated. Judging from the powerful oxidising action of nitrous acid as shown in a series of reactions well known to chemists, the extreme probability is that nitrous acid would affect the most important dietetic constituent of the flour—viz., the gluten—in such a way as to make it less digestible, and we can say the same of chlorine and of ozone. The remedy is in the hands of the public who, for the sake of their health and bodily well-being, would be well advised to abandon the fallacious notion that the whiteness of bread is a mark of its quality. On the contrary, it nearly always means an insipid, unpalatable bread, and an attractive flavour is a factor of considerable importance in connexion with the digestibility of food. The destruction of the natural colour of flour by bleaching agents synchronises with the destruction of its attractive flavour. Such tampering with "the staff of life" should be made illegal.

APPENDICITIS DUE TO THREADWORMS; PRESENCE OF THE PARASITE IN THE WALL OF THE APPENDIX.

INTESTINAL worms of various kinds—oxyuris vermicularis, ascaris lumbricoides, and trichocephalus dispar—have been found in the appendix vermiformis in appendicitis in circumstances leading to the conclusion that they were the cause of the appendicitis. Indeed, Metchnikoff has taught that worms are often the cause of appendicitis. He thinks that they may cause ulceration of the mucous membrane of the appendix, which may be a starting point of an infection which may penetrate the intestinal wall, and also that worms may plug the appendix and thus increase the virulence of microbes contained in it. However, some doubt may be entertained whether the worms found in the appendix in such cases are the cause of the appendicitis. At a meeting of the Société Médicale des Hôpitaux of Paris on Feb. 5th M. Brumpt and M. Lecène reported a case which is of great importance, as the causal part played by the worms—the oxyuris vermicularis—was beyond doubt, for the parasite was found in the intestinal wall. A boy, aged 11 years, was admitted into hospital on Sept. 19th, 1908. On the previous day he was seized with acute pain in the right iliac fossa, vomited twice, and became feverish. On admission the temperature was 100·7° F. and the pulse was 100. The abdomen was a little tympanitic and tender over the whole iliac fossa, where there was also muscular rigidity. The expression was good, but as the pains persisted in spite of the application of ice and withholding of food an operation was performed. On opening the peritoneum, which was a little red, some clear serous fluid escaped. The appendix, which was swollen to the size of the little finger and turgescent, was removed.

Rapid recovery ensued. On opening the appendix it showed numerous hæmorrhagic spots and acute folliculitis. Its lumen contained a blackish cord of partly coagulated and digested blood in which were imprisoned about 50 male and female threadworms. Some of them were fixed to the mucous membrane in the position of the hæmorrhagic spots. The appendix contained no fæces. It was hardened in formol and then in "Bouin's fluid" and cut in longitudinal sections which showed the lesions of acute appendicitis characterised by folliculitis and hæmorrhages. The submucous tissue was sclerosed from chronic inflammation. In certain points, corresponding to the ecchymoses, the mucous membrane was destroyed and irregular tracts of blood extended into the substance of the appendix. In a transverse section a worm was found in the wall of the appendix, which was thought to be a male oxyuris. Near it was a cavity surrounded by cells with flat nuclei. This cavity had been occupied by an oxyuris which had caused the cellular infiltration. Similar cavities were described in 1903 by Galli-Valério, who refers to spaces like perforations surrounded by a zone of infiltration containing microbes. In the case described above no microbes could be found in stained sections. This was perhaps due to the chronicity of the lesion, the microbes having succumbed to phagocytosis. This appears to be the fourth case on record in which the oxyuris was found in the wall of the appendix. M. Brumpt and M. Lecène think that appendicitis due to this cause must be frequent and that the worms are overlooked because they are not looked for systematically. If sections had not been made of the appendix their case would have been described as "hæmorrhagic folliculitis"—a name which may satisfy some pathologists but in no way explains the genesis of the disease. As the male oxyuris measures only from two to four millimetres in length and from a sixth to a quarter of a millimetre in diameter it may easily be overlooked. Cases have been described in which threadworms were found in the peritoneal cavity, and it has been thought that they reached this position by penetrating the wall of the bowel.

AN OLD-AGE PENSION STORY.

AN inquest on the body of an old-age pensioner—Mary Doran—was held near Dromore, County Tyrone, on March 1st and 2nd, in which a most revolting condition of affairs was disclosed. The police found the old woman not only dead but her face and neck completely devoured by vermin during the time she had been kept in the house since her death. Dr. A. M. Love of Drumquin, who examined the body at the request of the police, said that the back and abdomen were undergoing putrefaction, the flesh was devoured clean off the head and neck, and the features were unrecognisable. He thought that this was done by vermin. In his opinion the woman had been dead from 14 to 20 days, probably 16 days. He attributed her death to senile decay. Mr. A. H. R. Duncan of Omagh (as reported in one of the newspapers) said that he made an external examination of the body and considered that the deceased had been dead from 12 to 21 days. "There was a horrible smell of decomposition and it was enough to raise a plague of typhus fever. The like of it could only be expected in the Cannibal Islands, and the room where the dead body lay and surroundings were enough to kill anybody." The witness believed that the deceased had died from old age; there were no marks of violence and no bones were broken. The coroner, in reviewing the evidence, said he could hardly trust himself lest he might say something too strong in trying to describe the class of case they had just investigated. He considered it would be an insult to India or China or any other civilised nation of the world to have such a tragedy enacted in it, and he was very sorry to think that such a case happened in Ireland. Mr. Duncan had said that the house where the body was found was sufficient to cause a pestilence in the district. There might be an epidemic, and the house should be reported on. The jury returned a verdict that Mary Doran was found dead on March 1st last, and that she died from senile decay. They added that they were of the opinion that the friends should be censured for the fact that the death was hidden for a period of about 16 days. The worst feature of this horrible case was the fact that when the police went to the house the relatives (a sister and two brothers) attempted to conceal the fact that their sister was dead, one of the brothers saying, "she is away for the last few days and we don't know where she is." The living sister coming out of the room where the remains were found on the bed said, "there was no one in the room." When confronted with the horrible spectacle, one of the brothers and the sister had the audacity to say, while admitting the remains were those of their sister, that she had died "the night before between 12 and 1 o'clock." The suggested motive for such barbarous conduct was the fact that the deceased was in receipt of an old-age pension. One of the relatives drew it for her and at the inquest the pension cheque-book was produced showing by the Post Office stamp that the last payment had been made on Feb. 26th. At a meeting of the Omagh guardians held on March 6th it was recommended that the house of the Dorans should be destroyed.

PARALYSIS OF THE LEFT RECURRENT LARYNGEAL NERVE IN MITRAL DISEASE.

IN the *Montreal Medical Journal* for February Professor William Osler has reported three cases of a very rare complication of mitral disease—paralysis of the left recurrent laryngeal nerve. He points out that in cases of great dilatation of the left auricle with compression of the recurrent laryngeal nerve there may be a combination of symptoms and signs suggestive of aneurysm. Paroxysms of orthopnœa, cyanosis, the cracked voice, the paralysed vocal cord and pulsation in the second left intercostal space may be a most deceptive combination. The paralysis is due to compression of the nerve between a greatly dilated auricle and the aorta; in a few cases it seems to have been due to the dilated pulmonary veins, and in one case to pressure of the left pulmonary artery. In a few cases both recurrent nerves have been paralysed, and in explanation it has been suggested that the enlarged heart drags down the aorta and the right subclavian artery sufficiently to cause atrophy of the nerves as they pass beneath these vessels. The following are outlines of Professor Osler's cases. On June 10th, 1888, he saw a stout woman, aged 45 years, complaining of dyspnœa on exertion, paroxysms of coughing, and shortness of breath at night. There was a history of heart disease for many years. Her face and hands were slightly cyanosed. The apex beat was neither visible nor palpable. A feeble thrill could be felt under the left breast. The area of heart cardiac dulness could not be made out accurately, but it appeared to be increased. There were a presystolic murmur and a soft systolic murmur heard out as far as the mid-axilla. Her voice was cracked and the left vocal cord was paralysed. In September, 1889, she died in an attack of urgent dyspnœa. The necropsy showed mitral stenosis and great dilatation of the left auricle. In the second case a woman, aged 27 years, was seen in March, 1892. She complained of dyspnœa, palpitation, cough, and change in the voice. The apex beat was in the normal position and there was a thrill followed by systolic shock. Cardiac dulness began at the third rib. A rough presystolic murmur was followed by a loud snapping first sound and systolic

murmur. The left vocal cord was paralysed. In the autumn of 1893 anasarca came on and she died in November. In a third case a man, aged 46 years, was seen on Feb. 25th, 1908. He was suspected to be suffering from aneurysm. There were dropsy, œdema of the bases of both lungs, and dyspnœa. Examination of the chest showed a large area of visible impulse extending from the third to the sixth left interspaces. In the second interspace there was distinct pulsation as far out as five centimetres from the border of the sternum. On palpation the impulse was felt to be diffuse and the heart's action irregular. Double murmurs were heard in the mitral and aortic areas. The left vocal cord was paralysed and the voice was cracked. The patient had been healthy except for three attacks of acute rheumatism at the ages of 14, 26, and 40 years. Radioscopy showed that the left auricle was enormously enlarged and that there was no aneurysm of the aorta. Death occurred on August 24th. The necropsy showed that the area of heart uncovered by lung began at the second left chondro-sternal junction and passed outwards and downwards to the junction of the fourth rib with its cartilage and then transversely outwards. The aortic valves were incompetent. The left auricle was enormous. The mitral valves were much thickened and the orifice was narrowed. The left recurrent laryngeal nerve between the aorta and the left auricle looked sclerotic and of a duller white than elsewhere.

MEDICINE AMONG THE HILL TRIBES OF SUMATRA.

IN a paper sent by Dr. Römer, a Dutch colonial surgeon who practises at Médan on the east coast of the island of Sumatra, to the Academy of Medicine of Paris on "Medicine among the Bataks" (and published in *La Semaine Médicale* on Feb. 17th) some interesting particulars of these hill people, who are the last representatives of Sumatra cannibals, are given. They are very insensitive to pain and they live together with pigs and dogs in a state of filth and immorality. Married women are, however, faithful to their husbands. Although incest is, generally speaking, looked upon as a serious vice there are tribes in which a father is permitted to cohabit with his daughter the day previous to her marriage. They are very gluttonous and will eat putrid meat and rotten eggs. Their "medicine" is, like that of many other savages, largely dominated by their endeavours to propitiate evil spirits. They do, however, use massage, medicated baths, and drugs of various kinds. Unfortunately, their superstitions will not allow them to utilise the various hot and sulphur springs which are close at hand. Scabies is treated by means of poultices of curcuma and lime, and pruritus is soothed with poultices of cacao oil and lime or the leaves of cassia alata. Leprosy, of which frambœsia is looked upon as a precursor, is much dreaded, and sufferers are obliged to live at a distance from villages, the inhabitants of which take them food. Hare lip and goitre are common, though cretins are not often met with. In epidemics of cholera and small-pox the people desert their villages. Much has, however, been effected by the missionaries who have introduced the practice of vaccination. Rabies is said to be common. Wounds are treated by tobacco or other leaves or by applying the juice of a species of polygonum. Abscesses are opened and ractures are bandaged with splints. Syphilis is said to have been introduced in 1817. For this the juice of the root of pterocarpus indicus is considered a specific; smilax root is also employed. Gonorrhœa is very common. Although parturition usually gives very little trouble some midwives are said to be able to diagnose a transverse presentation and even to turn by external manipulation, and even embryotomy is occasionally performed. Abortion is practised both on girls and married women who do not like having too many children; the means employed include massage, some reputed abortive drugs, and perforation of the sac by means of a piece of bamboo. Failure in the case of young girls often leads to suicide for fear of ridicule. Poisoning is tolerably common, upas antiar, different kinds of strychnos, solanaceæ, and euphorbiaceæ being used. Sometimes sulphate of copper and alum are introduced into the pot in which rice is being cooked, and as arsenic is freely sold under the name of "Death to Rats" it may be occasionally employed for the removal of an obnoxious person.

THE EIGHTH INTERNATIONAL CONGRESS OF HYDROLOGY AND CLIMATOLOGY.

THE Eighth International Congress of Hydrology and Climatology, including geology and physical therapeutics, will be held this year at Algiers from April 4th to 10th, under the patronage of M. Jonnart, the Governor-General of Algeria. The last meeting of the Congress was at Venice in the autumn of 1905. The members of the Congress are divided into two classes: (1) titular members, consisting of medical men or scientific persons interested in questions of climatology, geology, hydrology, and physico-therapeutics; and (2) associate members, who include, amongst others, medical students, mayors and municipal councillors of watering-places, and the families of medical men. The subscription for titular members is 20 francs and for associate members 10 francs. Cards of membership will not be delivered save on payment of the subscription. The local secretaries for Great Britain are Dr. G. Pernet and Dr. Purves Stewart, 94, Harley-street, London, W. The general secretary of the Congress is Dr. L. Raynaud, 7, Place de la République, Algiers, to whom all communications may be addressed. An exhibition will be held in connexion with the Congress and communications regarding it may be addressed either to the general secretary or to M. Chappuis, 2, Rue Juba, Algiers.

X RAYS IN DIAGNOSIS AND TREATMENT OF SYRINGOMYELIA.

BOTH the diagnosis and treatment of syringomyelia give rise to many questions the answers to which are by no means as satisfactory as could be desired, in consequence of which uncertainty Dr. J. Holmgren and Dr. Alof Wiman of the Prefectural Hospital, Falun, Sweden, decided to publish in the *Nordiskt Medicinskt Arkiv*[1] an interesting case occurring under their care, in which the application of the x rays to the cervical portion of the spinal cord appeared to assist not only in improving the patient's condition, which it did to a very material extent, but to justify the diagnosis as against that of anæsthetic leprosy. Some previous observers have employed the x ray treatment, but the number of cases published have been very few and not generally fully reported. Thus Dr. Gramegna published two cases in the *Rivista Critica di Clinica Medica*, 1906, and M. E. Beaujard and M. J. Lhermitte three more in *La Semaine Médicale*, 1907, some further unpublished cases being referred to by the last-named writers. From these observations it appeared that the most marked effect of the x rays was produced on the paralytic and anæsthetic symptoms, and the least on the power of distinguishing heat and cold. This is exactly what the Swedish physicians found occurred in their case. Their patient was a working man, aged 51 years, who had been under treatment at various times for some eight years previously for ulcers of the feet and hands. Latterly the

[1] Nordiskt Medicinskt Arkiv, 1908, Band 41, published Feb. 3rd 1909. The paper is a very instructive one, and, being in French is accessible to most medical men.

tips of some of the fingers had become necrosed, which was thought by the patient to be due to frostbite, and the hands had assumed the combined condition of *main à griffe* and monkey hand, the small muscles being atrophied and giving the electrical reaction of degeneration. There was very little power of motion in the hands, though there was a certain amount of motion still in the thumbs. The muscles of the forearm and arm were not affected nor those of the lower extremities. There was local anæsthesia, however, in the legs and thighs, as well as in the forearms, analgesia extending still further and including in addition the buttocks and upper arms. X rays were then applied by means of a somewhat "hard" tube to the cervical portion of the spine, the anticathode being held at a distance of 25 centimetres from the skin. The sittings were of ten minutes and were continued daily for about a month, at the end of which time there was considerable improvement, especially in the power of the hand muscles. The loss of sensation in the forearms, too, was confined to a smaller area. When the patient was discharged about three weeks later he had gained considerably in weight and his depressed condition had given way to cheerfulness, especially as he felt able to resume his occupation. Had this case been one of lepra, as was thought possible at first, it is inconceivable that the application of x rays to the spinal cord could have had any beneficial effect, though observations by Dr. H. Brookman-Wilkinson[2] and Dr. O. Lassar, Dr. A. Siegfried, and Dr. Urbanowicz[3] seem to show that local applications of x rays to the anæsthetic areas have sometimes at least beneficial effects.

PHILTRES.

IT is curious to find relics of superstition in unexpected places. In the "Courtship Column" of a ladies' paper there recently appeared a letter from a young woman, apparently of fair education, asking for particulars about love-philtres. "He lives about a mile from my home," said the writer, referring to an estranged admirer, "and I should like to have him back very much. I have heard that there is some powder to be had which I should only need to put in the fire and read a verse from the Bible and wish him to come back, and that he would come. I should like you to give me the name of the powder and the way to use it." It is astonishing to find so frank a confession of faith in the virtue of a philtre or love-charm which has figured largely in many romances in the past. But the philtre has a special interest for medical antiquaries as it was certainly a relic of savage medicine, and because down to a late period it was regarded as a legitimate form of medication as well as of magic. The witches' brew in *Macbeth* is, indeed, only a philtre on a large scale. In fact, witches and wizards were anciently supposed to be the chief makers of philtres. In the scanty traditions of Druidism, perhaps still existing among the Breton peasants, a mystic brew is described, composed of the half-dozen or so plants in the Celtic pharmacopœia. Some drops from the cauldron containing the seething brew fall upon the finger of the dwarf who stirs it, and he, on putting his finger in his mouth, is endowed with the knowledge of all things. Melchior Schonwalder, replying to the learned Horstius in a disputation "De Natura Amoris," in the middle of the seventeenth century, declares that love-philtres are best composed of human blood, or of the small bones of frogs picked clean by ants, or of burnt laurel leaves. Horstius declares that many medical men approve of philtres, not regarding them as of the nature of magic. The idea at the back of the mind of the maker of a philtre was the thoroughly savage one of influencing the victim or patient at a distance and by means of symbolism. In this connexion Horstius cites the waxen images which people made and burnt, or melted, symbolically, when they wished to destroy particular enemies. The last relic of such burnings is the Guy Fawkes ceremony of our own boys, in which the image often represents an unpopular type or character of the period.

[2] Journal of American Medical Association, 1906, p. 315.
[3] Dermatologische Zeitschrift, Band xiii., 1906, p. 690.

THE VARIETIES OF TUBERCULIN.

IN the *Pharmaceutical Journal* of Feb. 6th Mr. F. W. Gamble describes the various forms of tuberculin. About these there has been confusion for some time and in many places, and Mr. Gamble's article will be of real service. In 1890 Koch produced Tuberculin Kochi, now commonly known as "Old Tuberculin," and in 1897 Koch's New Tuberculin T.R. was placed before the profession, followed in 1901 by Koch's New Tuberculin B.E. (bacilli emulsion). These were prepared from tubercle bacilli of human origin. Corresponding bovine tuberculins have been made since the formulation of Koch's view of the differences between the human and bovine organisms, but they have been employed only to a limited extent. They are sometimes known as "Perlsucht Tuberculins." The tuberculins are derived from cultures of virulent tubercle bacilli incubated in glycerine veal broth or on a suitable solid medium until a sufficiently exuberant growth is obtained. During the process of growth soluble toxins are synthesised as a result of the metabolic changes within the organisms and are excreted into the culture medium. Other insoluble toxins remain associated with the protoplasm of the bacterial cell itself. The following classes of tuberculins may be distinguished: (*a*) tuberculins obtained from the culture fluid containing the soluble excreted toxins; (*b*) tuberculins obtained from the bacillary protoplasm; and (*c*) those partaking of the nature of both (*a*) and (*b*). Class (*a*) includes Tuberculin-Original-Alt, a culture fluid filtered free from germs, and Vacuum Tuberculin, a germ-free culture fluid, evaporated *in vacuo* to one-tenth of its original volume. Class (*b*) is represented by New Tuberculin T.R. (Tuberculin Rückstand), prepared by extracting dried and powdered tubercle bacilli with water, after which the insoluble residue is dried, comminuted and suspended in dilute glycerine. Class (*c*) contains two members, "Old Tuberculin," a culture fluid containing the bodies of the organisms evaporated to one-tenth of its original volume, and filtered to remove the macerated bacilli; and New Tuberculin B.E., consisting of tubercle bacilli, dried, comminuted, and suspended in dilute glycerine. Tuberculin-Original-Alt is seldom employed in British practice; it closely resembles Denys's tuberculin, and must be distinguished from "Old Tuberculin," which is sometimes described as Tuberculin-Alt, or T.A., and is a much more powerful preparation. New Tuberculin T.R. is the most important of the tuberculins. It is standardised so that one cubic centimetre contains two milligrammes of dry constituent, which is yielded by, and is stated by Koch to be equivalent in immunising power to, ten milligrammes of tubercle bacilli. The doses given vary from 1-20,000th milligramme to 1-500th milligramme of dried tubercle bacilli, or over an even wider range. The administration of very minute doses has followed the use of Sir Almroth Wright's method of determining the opsonic index of the blood. "Old Tuberculin" was introduced by Koch as a curative agent, but in the large doses that were employed it was found to be an exceedingly dangerous preparation. But it is employed to diagnose the presence of tuberculosis, since in very small doses it produces a definite rise of temperature in tuberculous patients. The amount of solid matter present in this preparation is not commonly known; the dose is usually stated in decimal

fractions of a cubic centimetre, and varies from 0·001 to 0·0001 cubic centimetre. It should only be employed in the absence of fever. Recently special preparations of this form of tuberculin have been employed for diagnostic purposes by the production of a local instead of a general reaction. Thus, the ophthalmo-reaction of Calmette is based on the use of a purified solution of "Old Tuberculin." Von Pirquet has shown that a specially prepared solution of "Old Tuberculin" may be used for vaccinating the arm or thigh; and Moro has advocated the use of an ointment of "Old Tuberculin" as a local diagnostic agent. New Tuberculin B.E. differs from New Tuberculin T.R. in containing a small proportion of the water-soluble toxins similar to those that are present in "Old Tuberculin." It is standardised to contain five milligrammes of dried tubercle bacilli in each cubic centimetre and is therefore half the strength in bacilli of New Tuberculin T.R. It is less often used than the latter and is given in similar doses which are reckoned in fractional parts of a milligramme of dried tubercle bacilli.

FACIO-SCAPULO-HUMERAL MYOPATHY.

PECULIAR interest attaches to the record, given by Professor Landouzy and M. Lortat-Jacob in *La Presse Médicale* of Feb. 27th, of a case of family facio-scapulo-humeral myopathy, type Landouzy-Déjérine, inasmuch as it concerns a patient whose condition served for the original description of this variety of myopathy published by Professor Landouzy 30 years ago. Within recent years there has been a distinct tendency in the direction of the simplification of the various forms of myopathy, and evidence has been brought forward to suggest the absence of any real distinction between myelopathic and myopathic muscular atrophies, so-called. The occurrence of spinal-cord changes in peroneal muscular atrophy, for instance, and in other progressive myopathies has led to the denial of the existence of any true muscular dystrophy. In any case, where both muscular and spinal changes have been remarked, their degree has been so commensurate as to render the determination of the seat of the primary lesion a matter of considerable difficulty. The nature of the pathological alterations in the muscles has been thought to facilitate the distinction of the two types, but even where these alterations have been of the myopathic type changes have been found in the cord. The patient whose case forms the subject of the above communication was one of two brothers who came under the notice of Professor Landouzy at the age of 17 years and who died from pulmonary tuberculosis in 1902, aged 45. He was under constant observation for almost 30 years. In his youth he presented the characteristic involvement of the muscles of the face and shoulder and upper arm which is distinguished as the facio-scapulo-humeral variety, and the disease slowly progressed until he was permanently crippled. For the last 17 years of his life he was confined to bed, unable to sit up, unable to do anything for himself except with the flexors of his fingers. At no time was fibrillation in the affected muscles observed, nor was cutaneous sensibility affected. Electric excitability was diminished in proportion to the degree of wasting of the muscles. At the necropsy a minute and painstaking dissection of the musculature was made and the skeleton was preserved and subsequently mounted. To the naked eye most of the muscles appeared simply as pale yellow fibrous sheets; those of the face could not be distinguished at all, even by the microscope; in the arms the flexors were of a pale rose tint; one of them, the flexor carpi ulnaris, was the solitary arm muscle unaffected. It is interesting to note this relative preservation of the flexors. Several of the muscles were yellow, with a few pink muscle bundles visible here and there. Microscopical examination showed that even in the most degenerated muscles the pathological process was unequally distributed. The skeleton was thin and slender; the long bones were rarefied and the thorax and pelvis deformed. A series of beautiful radiographs illustrates the honeycombed and lace-like texture of the bones. But the remarkable fact remains to be noted that the cells of the anterior horns of the spinal cord, by Nissl's method, and of the bulbar centres, were, with few exceptions, perfectly normal, and this in spite of a progressive muscular disease of 30 years' duration. Similarly, the peripheral nerves appeared normal. Thus the original account of the disease as a true myopathic atrophy, without any change in the central or peripheral nervous systems, receives ample justification.

MEDICAL MEN AND PATIENTS' WILLS.

IN our issue of March 6th we made certain comments under the above heading upon a case then recently heard and settled before Mr. Justice Bigham. We have since ascertained that the facts before the court and connected with the settlement of the action did not justify all the words we published. In the circumstances we desire to retract the comments we made upon the subject. Especially do we desire to do this so far as those comments can possibly be read to reflect in any way upon the plaintiff in the case. Mr. Justice Bigham, in whose hands the terms of settlement were left, definitely pointed out that there was no reflection upon the plaintiff's character at all, and we are sorry if anyone read such a meaning into our words.

THE INFLUENCE OF HEREDITY AND ENVIRONMENT ON SIGHT.

THE Francis Galton Eugenics Laboratory at University College, London, which is doing such good work in many directions under the control of Professor Karl Pearson, has recently issued a "First Study of the Inheritance of Vision and of the Relative Influence of Heredity and Environment on Sight," by Miss Amy Barrington and Professor Karl Pearson. The paper is a mathematical inquiry founded upon various statistics, the chief of which are two communications by Dr. Adolf Steiger of Zürich on the corneal curvature and the Report on 1400 School Children issued by the Edinburgh Charity Organisation Society. Statistics derived from elementary schools in London and Glasgow have also been examined but afford less valuable material. We make no attempt to criticise the writers' arguments and calculations in detail, but we think that their general conclusions will be of interest. They find that there is no evidence whatever that overcrowded, poverty-stricken homes, or physically ill-conditioned or immoral parentages are *markedly* detrimental to the children's eyesight. There is no sufficient evidence that school environment has a deleterious effect on the eyesight of children. Though changes of vision occur during school years they hold that these are phases of one law of growth, a passage from hypermetropia to emmetropia and myopia of the eyes of "unstable stocks." They find ample evidence that refraction and keenness of vision are inherited characters, and that the degree of correlation between the eyesight of pairs of relatives is of a wholly different order to the correlation of eyesight with home environment. Intelligence, as judged by the teacher, is correlated with vision in only a moderate manner (0·16). We scarcely think that the data justify so strongly worded an *ex cathedrâ* statement as that made by the writers in conclusion. "The first thing is good stock, and the second thing is good stock, and the third thing is good stock, and when you have paid attention to these three things fit environment will keep your material

in good condition. No environmental or educational grindstone is of service unless the tool to be ground is of genuine steel—of tough race and tempered stock." The words are too sweeping.

ATHLETICS FOR SCHOOL BOYS.

AT a meeting of the Medical Officers of Schools Association held on March 10th various propositions dealing with the many questions involved in school games and athletics were passed. All branches of preventive medicine have made such strides during the past 35 years that it is no wonder that the somewhat happy-go-lucky ways in vogue at least as late as the "seventies" are no longer to be found. A glance at the resolutions passed by the association shows that they are founded on common sense. For instance, an entrance medical examination, the provision of at least one hour between a meal and active exercise, and the insistence of special caution in the resuming of active exercise after such diseases as diphtheria, influenza, and measles are regulations which, if carefully carried out, will be preventive of much harm. With regard to races, the chief recommendation is as concerns the quarter mile, a distance which, as everyone knows, is most punishing. For this race, says the association, boys should be carefully selected and its effects equally carefully observed by the medical officer and the master. The association concludes by giving it as its opinion that intelligent supervision as now practised at public schools in relation to active exercise is most necessary, but that it also reduces the risk of strenuous sport to an insignificant minimum. There can, we think, be no doubt of this, and there is another fact which is somewhat overlooked by many people. That is that the school boy is always more or less in training. He has regular hours, regular exercise, and, as a rule, simple food. The condition of the average school boy becomes very obvious when an old school team comes down to play a football match, for although the visitors' team may be far superior individually to the home team, yet the latter frequently wins. The sensible resolutions drawn up by the association should go far to reassure nervous parents and to insure the boys of the present day getting physical and, we may add, moral, good out of their school days.

THE DIGESTIVE FERMENTS IN THE INFANT.

AN interesting paper was read before the German Society for Children's Diseases[1] by Dr. J. Ibrahim of Munich giving the results of his own study of 12 newly born and 22 premature infants, as well as a review of the literature of the subject. Trypsin was found to be present in the pancreas of the fœtus in the form of trypsinogen, which could be rendered active by enterokinase. This substance could be extracted from the intestinal mucous membrane in the newly born. Secretin was present in the newly born and also in the fœtus in some cases. An amylolytic ferment could be demonstrated in the parotid and the submaxillary glands as well as in the pancreas in premature infants in the later months as well as at term if it was allowed to act on starch for 12 or 24 hours. It was found to appear in the parotid distinctly earlier in fœtal life than in the submaxillary gland or pancreas. Maltase, lactase, and invertin were absent from the salivary glands and from the gastric mucous membrane. Maltase was sometimes found in the pancreas of the newly born, but lactase and invertin were never found in that organ even in older sucklings. Lactase was found in the intestinal mucous membrane of the newly born, but it appears to develop late in fœtal life and is often wanting in viable premature infants. Maltase was earlier in its appearance and invertin is one of the earliest ferments to appear in the human embryo. In regard to fat-splitting ferments or lipases peculiar results were obtained. No ferment with this property could be separated from the mucous membrane of the intestine, but, on the other hand, a lipase was found in the gastric contents and in the mucous membrane of the stomach both in full term and premature infants. Dr. Ibrahim in some experiments carried out in conjunction with Dr. Kopeé found that even with a diet free from fat or containing but little fat the gastric contents of sucklings contained a powerful fat-splitting ferment.

[1] Jahrbuch für Kinderheilkunde, Nov. 7th, 1908, p. 579.

LEPROSY IN AUSTRALIA.

THE subject of leprosy is at present engaging a good deal of public attention, both at home and abroad, and we understand that an international conference on this disease will be held at Bergen during the month of August of this year which will be attended by delegates from the countries more immediately interested. For this reason the report by Dr. J. Ashburton Thompson on leprosy in New South Wales during 1907 is of interest. At the end of 1906 20 persons were under detention for this disease at the leprosy lazaret; four fresh cases were admitted during 1907, leaving 22 patients in the lazaret at the end of the year. Of these, 11 were white and 11 coloured persons. From 1883, when the lazaret was established, to the end of 1907, 114 persons altogether have been isolated there. Attached to the report are various appendices, including clinical and etiological notes of the cases admitted in 1907, "survey notes" of all the patients under detention, with description of the symptoms and the appearances of the disease in each case, and the nature of the treatment employed. There are also notes on some special drugs which have been used in the treatment of leprosy, including iodoform, iodipin, fibrolysin, and formalin. Appended, too, is an abstract of a lecture on leprosy delivered by Dr. Thompson at the Polyclinic and Post-graduate School, Chenies-street, London, in November, 1907, in which reference is made to the new specific treatment by "benzoylnastin," discovered by Deycke Pasha in the course of his official work in Turkey, to whom we hear from another source that the Colonial Office has quite recently consented to afford opportunities for the treatment of lepers by this method in one of our West Indian colonies in coöperation with the local medical officers. At the conclusion of his report Dr. Thompson gives a tabular statement of the cases of leprosy reported in each of the States of the Commonwealth of Australia in 1907, comprising in addition to the four cases in New South Wales above named, 21 in Queensland, two of whom, however, should have been included in the list for 1906, and one in South Australia. It is satisfactory to learn that no cases were notified in Victoria, Western Australia, or Tasmania.

WE regret to record the death of Captain Frederick Hallam Hardy, R.A.M.C., which took place at Aden on March 8th from sleeping sickness. The deceased officer, who was only 36 years of age, contracted the disease whilst studying it in Nyassaland under the Colonial Office Commission.

Mr. A. J. Pepper will deliver the Harveian lecture of the Harveian Society of London at the meeting on March 25th at 8.30 P.M. The subject of the lecture will be "Thirty Years' Hospital Experience and Practice."

A TELEGRAM from the Governor of Hong-Kong to the Secretary of State for the Colonies announces that four

cases of plague with one death were reported during the week ending March 13th.

THE annual meeting of the St. Marylebone Health Society will be held on Monday next, March 22nd, at 5 P.M., in the Town Hall, St. Marylebone-lane. The Mayor of Marylebone will take the chair, and among others who have promised to speak are Dr. Newsholme, the principal medical officer to the Local Government Board, Mr. Francis Morris, chairman of the board of guardians, Marylebone, and Dr. Meredith Young, medical officer of health of Marylebone.

H.M. the King of Roumania has given a further decoration to Mr. Edward D. Madge by the bestowal of the Order of the Star of Roumania upon him.

H.M. the King of the Hellenes has decorated Mr. H. Stanley Turner with the Knighthood of the Royal Order of the Saviour.

THE LATE MR. THOMAS WAKLEY.

WE have received a very large number of letters of sympathy upon the death of Mr. Thomas Wakley, of which we select two brief specimens for publication. We are sure that the affirmation of Professor Howard Marsh and Mr. A. J. Pepper of Mr. Wakley's sterling merits will be read with pleasure by many of our readers, whether personal friends of the late Mr. Wakley or no.

Professor HOWARD MARSH writes:—

I wish, both as a member of the medical profession and as a personal friend of the late Mr. Wakley, to add my own to the many deep expressions of regret which you will be now receiving. We have lost a most worthy and enlightened wielder of great powers which he always turned to their highest uses, and we have also lost a friend whom we greatly respected and valued.

Mr. PEPPER writes:—

I should esteem it a privilege to be allowed to add a word of personal appreciation of the life and work of the late Mr. Wakley to the leading article and obituary notice in last week's LANCET. Some 25 years have elapsed since I first had the pleasure of his acquaintance. I learned the nobility of his character both in his capacity of editor and friend. If two words more than others will describe his mode of life, his thoughts, and his deeds, they are generosity and temperance. However much Wakley differed from the opinions of others he was ever ready in according to all the best intentions and ever willing to believe that there was some right on both sides in all disputes. His retiring disposition was the fitting complement of his solid acquirements. One more thing should be added. Possessing a liking for sport in its most humane forms, it was foreign to his nature to willingly witness, much less to cause, pain to the brute creation.

THE LAST ILLNESS OF MR. THOMAS WAKLEY.

We have received a note for publication giving more details of Mr. Wakley's last illness. He had for some two or three years suffered severely from pyorrhœa alveolaris and did not unfortunately take the matter in hand soon enough. When it was diagnosed the condition was subjected to most careful and elaborate treatment by his dentist, under which it slowly though steadily disappeared, but the mischief done to the liver by septic absorption remained, with gradually fatal results. The case was throughout its early stages very obscure, but Mr. Wakley's medical adviser, Dr. A. Baldock, who was also his personal friend, considered from an early stage of the symptoms that the old story of Riggs's disease must be taken into account, and with this view both Dr. J. F. Goodhart and Dr. A. E. Garrod, who were called in consultation, concurred.

PROBLEMS IN MENDELISM AND SOME BIOLOGICAL CONSIDERATIONS: HUMAN ALBINOS.

BY GEORGE P. MUDGE.

AT the discussion on Heredity which took place recently at the Royal Society of Medicine I had no opportunity of adequately replying to Professor Pearson's second speech, which he made in reply to one of mine. As the question of human inheritance in all its aspects is one of the greatest importance to medical men, and is even of national importance, it is perhaps desirable that the problems connected with it should be discussed as they arise. Such discussion will serve the useful purpose of emphasising the importance of the subject and it may indirectly help in leading towards a clearer understanding of it. It will also serve to indicate to medical men and others who are in a position to collect data, the nature of the observations that are required and the complexity of the factors with which we have to deal.

Let us consider Professor Pearson's difficulty with regard to human albinos. He says (p. 56)[1]:

> When you come to investigate the subject of albinism and inquire what you are to do with a given case which is represented as that of an albino, extraordinary difficulty arises as to how you are to classify it at all. No simple category, like albinotic or non-albinotic, can cover this difficulty. There is every grade of albinism not only in man but also in animals. Individuals may have been all their lives through regarded as complete albinos, but when the post mortem takes place they show pigment in more than one direction.

Now the problem we are concerned with is not whether such types as Professor Pearson has mentioned exist or not, for that is admitted, but whether human characters, including albinism, behave in their hereditary transmission according to Mendelian principles. Professor Pearson says (pp. 55 and 57) that these principles "do not hold for any plant or animal or for man." We must therefore consider what is the visible expression of Mendelian inheritance? We may say in one word that it is the evidence of segregation. Wherever segregation occurs there Mendelian inheritance is operating. Now pigmentation or any other given character can exist in various grades or degrees, and at one end of the series of grades the character may be large in its development, and at the other end it may be extremely small or absent. In the case of pigmentation this last stage or absence of it constitutes albinism. The step before this last stage may be a microscopic grade—a degree of development so small that it is microscopic. Between this penultimate grade and the most extreme grade of total absence of the character it would be impossible to distinguish with the naked eye. And, therefore, *visibly*, and for *practical* purposes, this penultimate grade would have to be described as "absence" of the character. And so long as this *visible* absence breeds true to its *visible* condition, in different kinds of crosses, and so long as it can be segregated, it is obeying all the practical requirements of Mendelian inheritance. The Mendelian regards these grades as having arisen as separate and independent mutations, and he believes that when their hereditary behaviour has been fully worked out each grade will behave as a specific character and in accordance with Mendelian principles. This belief for the smaller and smallest grades is based upon an actual knowledge of what the larger grades are doing. If the larger grades behave in Mendelian fashion, as undoubtedly they do, it is for Professor Pearson to produce evidence which shall show that the smaller and microscopic grades behave differently. The work of Professor Johannsen strengthens our belief in our conception alike of the nature and the probable behaviour of the smaller grades.

In the light of these general considerations let us deal with Professor Pearson's specific objections with regard to human albinism. He says there are individuals who by every visible sign are albinos and yet upon microscopical examination of the tissues of the eyeball show a microscopical amount of pigment. He also implies that we cannot therefore be sure that the pure blue eyes of ordinary people are really blue and that they may not contain a microscopical amount of yellow or brown pigment. Now, everything of this kind is a matter of definition, and the preciseness of our

[1] Proceedings of the Royal Society of Medicine, vol. ii., No. 3.

definition advances with the progress of our knowledge. At present an albino is defined as an organism in which pigment (except the blood and liver pigments) is completely absent. For practical purposes this definition has to be translated into the qualified one—that it is an organism in which visible pigment is absent. Light or dark brown-eyed individuals are those in whom brown pigment is visible. Blue-eyed persons are those in whom, upon careful examination (which is always implied), no visible yellow or brown pigment can be detected.

Now to argue that some of these latter may contain microscopical pigment which is foreign to their apparent (visible) nature is to mask the real question at issue. The question we are now concerned with is not whether there are two types of blue eyes—i.e., those which are absolutely pure and those which may contain a microscopical amount of pigment, but whether visible blue eyes breed and segregate true to their visible condition. If, when visible blue eyes are mated to visible yellow or brown eyes they behave as a recessive, and can be extracted true to their visible condition and occur in approximately the expected ratio, then we are dealing with a Mendelian phenomenon pure and simple. And the same consideration holds with regard to human albinos. What we are at present concerned with is visible albinism and visible pigmentation. We are not now concerned with masked pigmentation. This problem awaits inquiry and is already, as a matter of fact, receiving it.

That there may be two types of visible albinism and of visible blue eyes is possible. One of these types in each case may be actually what it appears to be, and the other type may be only apparently what it seems to be, and may really carry an invisible amount of pigment foreign to its seeming character. This consideration brings us to a more general problem—i.e., the existence and nature of intermediates or grades. I have already dwelt upon this wider problem.[2] But I would like to deal now with the specific grades which are under consideration. The Biometricians are hopelessly lost upon this question of intermediates. How far they are lost is manifested by Professor Pearson's cautious refusal to bind himself down to one of the two conceptions regarding them.[3] The Mendelians believe, as I have just pointed out, that these various intermediates may be each of them mutations, each with its own degree of fluctuating variation around a stable mean, and each breeding true within the limits of this variation. The apparent or visible human albino with his microscopical amount of pigment, may be on this view a stable grade, segregating true to this condition. So, too, is the visible human albino without even microscopic pigment—that is, the absolute albino. Professor Johannsen's work on the transmission of weight of bean seeds and of the existence of "pure lines"—that is, intermediates of definite grades—each of which breeds true to its own mean, supplies us with the first definite, preliminary, and experimental evidence for the justification of this tentative belief. The extension of this evidence to animals and to other cases of bi-parental inheritance will convert this belief into a statement of fact.

It may be said that I am pushing matters to a very fine degree of discrimination by the contention that a person visibly an albino but yet containing a microscopic amount of pigment, is a separate mutation and a distinct grade. It may be urged that there can be therefore so many grades and on this view so many possible mutations, that it becomes an inconceivable hypothesis. I admit that it is one which may well present a difficulty of this kind to those who have not hitherto thought very much about it. But yet there are facts which lend great support to it. We are all familiar with the large single comb of fowls of the Mediterranean races like the Leghorns and the Minorcas. Now what does the Mendelian, from this standpoint of mutational grades, say is possible in regard to the fowl's comb? Clearly he says that a race can arise without any comb at all by a single bound or sport—that is, by a single mutation of relatively large moment. And no one, I take it, would deny the possibility. It is a conceivable phenomenon. And I have already elsewhere cited instances of some known mutations.[4] But if the Mendelian were to say that we can have a mutation which will not go quite the whole jump but will stop short by just the smallest step and leave a comb represented by the veriest little pimple, then it is possible he might be laughed at and that scornful things might be said of him in a "Grammar of Science" or in a volume of "Biometrica." But such a comb actually exists in the Breda fowl and it breeds true. That it is really a minute comb, but one which only lacks substance and not potentiality, is shown by the results of crossing it with a single comb or a rose-comb. It is a comb with a certain peculiarity which does not affect the argument. Here, then, we have a condition which is not absence of a comb but yet is next door to it. It is an extremely small grade. It is quite constant in its heredity behaviour and breeds true. This comb, I submit, demonstrates how small the grades which are possible may be, and if this is true of a fowl's comb, why not of human albinism and of human eye colour? One could multiply these examples but space forbids.

Professor Pearson may just as logically argue that we can learn nothing of the transmission of the fowl's comb because the Breda comb is such that it is difficult to say whether we ought to class it as a comb or as absence of a comb, as to urge that because there are small grades of human albinism we cannot determine their heredity. As I have already pointed out, the so-called albinos of Professor Pearson are not albinos at all. They are various grades of pigmented individuals. It is idle for Professor Pearson to say that they come from albinotic stocks unless he can assure us that these albinotic stocks are composed of absolutely true albinos. The adjective "albinotic" may cover anything. If these albinotic stocks simply consist of individuals with light or reduced pigmentation, then we are not dealing with albinos at all. The samples of lightly coloured hairs (washed-out golden) which he exhibited by means of the epidiascope as hairs of albinos were nothing of the kind; they were the hairs of pigmented persons.

The argument has been a little long and involved; let me therefore summarise it in a few words. A human albino is a person devoid of visible pigment; to be quite accurate, he is devoid of all trace of pigment, except, of course, the vitally important pigments, such as hæmoglobin and those which give bile and muscle their colour. But for practical purposes, that is, for the purposes of collecting human data, the absence of visible pigment constitutes an albino. And the presence of visible pigment, be it ever so light in nature or small in amount, constitutes the individual a pigmented person. But we have to recognise that there are grades of pigmented persons. We have to recognise, too, that the hair-pigment may be a very different colour from the eye-pigment. And what for the present we have to look for is whether *visible* albinism and *visible* blue-eyedness breed true to their visible condition and are transmitted according to Mendelian principles. And, further, whether the different grades of light or reduced pigmentation are also similarly transmitted. That is, does a light grade after it has been mated to a dark grade segregate out again in the same degree of lightness? That question can be best answered from a study of cousin marriages. But in this part of the investigation the existence of individual variation, and in some families the existence of different degrees of pigmentation as age advances, must be borne in mind. For it is known that some people, extremely fair or extremely little pigmented when young, have become darker or more extensively pigmented as age advanced. Therefore, the comparison must be made in these cases at the same age for the different individuals in the pedigree, or an adequate allowance made.

I would like to add a word as to the numerical results. It is contended that up to now the albinos are far too numerous. This may be true of certain families. But personally I do not place any great value upon actual numerical coincidence or approximation between result and theoretical prediction. And for this reason: it is impossible at the present time to say in all cases whether theoretical prediction and result are coincident. Let us consider for a moment what it is the Mendelian actually predicts. He does not, except in a qualified way, predict the number of individuals (zygotes) who shall bear the alternative characters, but he does predict the number of gametes (sex-cells) which shall do so. This is quite a different matter, and for two reasons. It may be that in normal cases the individual that develops from the fertilised egg will be an accurate, a full, and a precise index of its nature and qualities. But it is conceivable that there may exist conditions in the somatic cells which may mask the truth. And

[2] Ibid., p. 111. [3] Ibid., p. 111. [4] Ibid., p. 114.

nowhere is this more easily conceivable than in a character like pigmentation. But the segregation of characters in the sex-cells and the development of the precise proportion of the different kinds of sex-cells may be none the less true because the somatic cells are subject to special and disturbing conditions. Living cells are more plastic and more subtle in some of their operations than marbles of burnt clay or of vitrified silica. But there is another reason why it does not necessarily follow that the zygotic (person) results are a true index of the gametic ones. An individual may carry two kinds of sex-cells and it does not at all follow that they will be both fertilised in the same ratio. There may be such a thing as gametic selection in regard to fertilisation.

It is conceivable, too, that the struggle for existence begins not at birth but at fertilisation. Indeed, we know it does. Has Professor Pearson ever thought of the earthworm's problem? The earthworm lays something like 20 to 24 eggs in its cocoon at about the same time and these are fertilised also at about the same time. But only one young worm emerges forth alive from that cocoon. What will Professor Pearson have to say to disturbances of numerical proportions in a case like that? Remove the *locus* of this destruction from outside an earthworm's body to inside a mammal's uterus or Fallopian tube, and we have a disturbing factor that will make us cheerful at the mathematician's dilemma. Suppose an earthworm is a heterozygote and some of the spermatozoa which will fertilise its eggs are also heterozygous and some are homozygous, and that in this struggle for birth a recessive or a dominant homozygote or a heterozygote is favoured in the life and death conflict, where, then, is the validity of the mathematicians' fetish of numerical proportion? When will the biometrician learn that life is something more than numerals? If it is the developing homozygote that is thus favoured in the struggle, where is our hope of ever seeing a definitive heterozygote? There is none, in spite of Laplace's theory of Probability, or of those newer instruments that are designated under the comprehensive title of "Biometry."

The same sort of struggle for birth goes on in plants and may be exemplified in the megasporangium of *Selaginella* and in the embryo-sac of *Pinus*. In this latter plant there may be from 16 to 20 embryos developing at the same time within the embryo sac of a single seed. But only one comes forth to germinate, and of these which are successful at birth only a very small proportion ever become trees of the forest. Here, too, we can conceive the same processes at work—i.e., a pre-birth struggle for existence involving an elimination of certain types and a post-birth struggle involving a further extinction of certain types before the definitive stage of life is reached. What the Mendelian does is to predict that all the types shall be represented in the gametes which are formed, but he cannot ignore the fact that when these gametes are so formed and fertilised there exists in some cases a struggle for existence which may result in the extinction of certain types of zygotes. The prediction, therefore, while true of the gametes, might be falsified by the zygotes. That there is a selection of gametic and zygotic types going on is perfectly clear. But upon what this selection depends is not so clear. The factor or combination of factors which determines it may or may not be correlated with one of the two particular units of the allelomorphic pair with which we are dealing. If there is no such correlation, then the zygotic result may coincide with the gametic prediction and the Mendelian ratio will be visibly manifested; but if there is such a correlation, then a disturbance of the factors concerned is introduced and the Mendelian prediction, true enough for what it has predicted, will not be true for what it has not predicted—i.e., the proportion of the zygotes. For the Mendelian prediction, which deals with gametes, can only be extended to the zygotes if these represent in any orderly way the essential nature of the gametes out of which they arose.

Considerations of this sort show how complex are biological problems, and it is not our fault if the mathematician has failed to grasp them. If living cells were marbles in a bag and could be shaken up to an uniform distribution then we should expect proportions to be rigidly fulfilled. But even then, only in the long run. Therefore, when the evidence from a very wide range of phenomena, extending through the plant and animal kingdom up to Man, is definitely Mendelian in its indications, we are justified in believing that where we have cases in which the Mendelian results are only partial or are nearly but not quite complete, there are disturbing factors existing which future research will elucidate. And among these, disturbances of numerical proportions may be ranked as the least significant, for in all these cases the central and cardinal feature of Mendelism—i.e., segregation—is demonstrably proved to exist.

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THE ROYAL COMMISSION ON THE POOR-LAWS AND RELIEF OF DISTRESS.

IV.[1]

A VIEW OF THE MAJORITY REPORT.

WE have laid before our readers in the preceding articles a general outline of the proposals in relation to the medical relief of the sick poor which have been made respectively by the majority and by a minority of the Commissioners and a summary of the statistics which the Commissioners had under consideration. We have now to consider to what extent and in what manner the proposals of the Commissioners would affect the members of the medical profession with regard to their status, to their remuneration, or to the facilities which would be afforded for the effective discharge of the duties committed to them. The often misquoted dictum of King Solomon that in a multitude of counsellors there is safety does not appear to us to be illustrated in all the recommendations of the Majority Report, so far as these relate to medical attendance upon the sick, and we are not surprised to see that the Poor-law Medical Officers' Association is of this view. It is possible to regard the occurrence of sickness among the poor from several points of view; among others from those of the pathologist, of the philanthropist, of the statesman, and of the grandmother; and all of these may, we think, be discovered mingled in different and constantly varying proportions, or even cropping up singly from time to time, but generally with a preponderance of the grandmaternal element, in the 65 folio pages which the majority have devoted to the special question of "Medical Relief" and which Dr. Arthur Downes has criticised with shrewdness and penetration in a separate memorandum. The resulting "blend" cannot be regarded as either homogeneous or satisfactory, and the enforcement of the recommendations would, it appears to us, be productive of a miniature social revolution unattended by any prospect of an equivalent benefit. In saying this we are not without appreciation of the great value of the labour that has been carried through by the Commissioners. We have already referred to the report as a whole as one of the most important documents dealing with the social life of this country that we have ever read, and the amount of industry which has gone to the collecting and compiling of the evidence, the sifting of it, and the arriving at conclusions is so vast, and in many directions so good, that the result can stand criticism upon special lines. The case for the abolition of the board of guardians, which opens with a survey, supported by statistics, of the disappointing issue of a generation of effort under boards of guardians, is reinforced by one of the most melancholy tales of State wastefulness which a nation has ever been asked to peruse. As the Commissioners say, the increased expenditure upon the pauper, whose multitude does not go down but whose individual cost to the State has doubled since 1870, has done little or nothing towards diminishing the extent of pauperism. We are spending 20 millions of money more in education than in 1831 and 13 millions more in sanitation and prevention of disease than in 1841 (we take these figures from an admirable summary of the Report of the Poor-law Commission which appeared in the *Times*).[2] Notwithstanding an annual expenditure equivalent to nearly 60 millions a year

[1] Nos. I., II., and III. were published in THE LANCET of Feb. 27th (p. 638), March 6th (p. 706), and 13th (p. 782), 1909, respectively.

[2] The Report of the Poor Law Commission. Reprinted from the Times. Price 4*d*. Printed and published by the Times, 2, Printing House-square, London.

we do not make headway against the various problems of pauperism.

The Commissioners consider carefully the case for the enlargement of the Poor-law area and for the direct appointment of guardians. They lay down the following as the main principles upon which a new scheme which they call Public Assistance is to act, viz. :—

1. The treatment of the poor who apply for Public Assistance should be adapted to the needs of the individual, and, if institutional, should be governed by classification.
2. The public administration established for the assistance of the poor should work in coöperation with the local and private charities of the district.
3. The system of Public Assistance thus established should include processes of help which would be preventive, curative, and restorative.
4. Every effort should be made to foster the instincts of independence and self-maintenance amongst those assisted.

Insurance against unemployment, labour exchanges, the regularisation of employment, and in front of all, the education and training of the young are alike discussed, and under every heading the signs of painstaking care on the part of the Commissioners are obvious. The subjects were too enormous for treatment within the cover of one Blue-book, however extensive, but gallant endeavour, sometimes successful, has been made.

To come to medical relief under the Poor-laws, the existing system is too well known to our readers to call for any description even of its principal features. Each union is divided into a certain number of "districts," to each of which a medical officer is appointed by the guardians, and, when appointed, he possesses reasonable tenure of office. His duties are to attend professionally upon certain persons within his district who are on a "permanent list," and upon others who from time to time present "orders" from the relieving officer. He is also required to furnish reports of his proceedings, in specified form, to the guardians, and is empowered to recommend extra relief in the form of various necessaries for the sick; but the guardians retain discretion as to the extent to which these recommendations shall be acted upon. They are not supposed to be judges of the wants of the patients, but they are judges of the degree of poverty which exists in the particular instance, and which may or may not render it necessary for these wants to be supplied at the public cost. The grievances of the medical service, speaking generally, may be summed up under the heads of a general inadequacy of payment and of an inconvenient division of districts; but to these must be added what is, from a professional point of view, far more serious than either, in the shape of the constant necessity to strive at the making of bricks without straw. The parochial medical officer is called upon to contend against disease in its worst and most varied forms; and he is unable to attain to the conditions which alone would enable him to command a fair proportion of success. He sees the ailments of middle-age pass into hopeless chronicity; he sees the ailments of childhood permanently arrest the development and curtail the usefulness of the sufferer. His real enemies are "poverty, hunger, and dirt," far more even than the diseases which they engender or promote; and he must often recoil disheartened before the inequality of the contest in which he is engaged. The problem before statesmanship is how to control disease among the poor and to diminish the evils which it produces among all classes of the community, and this problem is met, on the part of the majority of the Commissioners, by a suggestion that the poor should subscribe to provident dispensaries and that the parochial medical officer should by-and-by be superseded by the officials whom the managers of these dispensaries would appoint. It is further suggested that a variety of institutions, hospitals, dispensaries, and the like should be induced to come within the lines of some general scheme under which their operations would be systematised. It is quite clear that central control would be necessary, but the Commissioners have forgotten the familiar fact that the governing bodies of such institutions are as a rule almost morbidly jealous of their independence and of their unfettered freedom of action, and would be certain to resent the smallest external interference with their affairs. If such interference were pressed the result might be a large withdrawal of subscriptions and even the practical disappearance of the institution concerned.

In the whole series of recommendations under the heading of medical relief or assistance there is much that seems to us unpractical and impracticable. This no doubt arises from the complexity of conditions with which the majority of the Commissioners were unfamiliar at starting, but it renders extremely difficult the task of definite criticism, particularly as the most enormous amount of evidence was taken and was most patiently sifted. The Commissioners seem to have approached the question too much as if the point to be determined were how to give the sick poor more and better physic, or how to enable a patient to choose the particular dispensary doctor to whom he or she would go in quest of a mixture. This is what we mean when we speak of the grandmaternal point of view. The increase in the staff of the Poor-law medical officers of the Local Government Board is a sound idea—it must lead to more frequent and regular inspection of all arrangements for medical relief. But when we come to the recommendations for making medical treatment more readily available the Commissioners hardly seem to us to appreciate the many-sided difficulties against which, from the very beginning, the proposed arrangements would be called upon to contend. A leading feature of these arrangements is that special county medical assistance committees should be formed to coöperate with the public assistance authorities, and the suggestion is that these local governing bodies should be partly composed of, or appointed by, local branches of the British Medical Association, of representatives of the health committee of the county or county borough councils, and representatives of local hospitals, nursing associations, dispensaries, and friendly societies. The Commissioners here appear to have suggested the blending together of incompatibilities. The British Medical Association is quite able and competent to safeguard the interests confided to it, and we grant the desire of everyone concerned to work unselfishly, but the interests to be brought into common are too variable for peace, and the welfare of the medical officers, of the sick poor, or of the wider public endangered by their sickness might await consideration while minor matters were being adjusted. We fully agree with Dr. Downes in the weighty pronouncement in which he declares that he views with grave misgivings the suggestion of a wholesale and imminent disruption of existing agencies, and the proposed transference of the work of relief to a complicated, untried, and (as he "ventures to think") unworkable system of machinery. We cannot conceive that any responsible minister of the Crown would ever be likely to embody more than the leading features of such a scheme in a Bill to be presented to Parliament. If the unexpected in this respect should ever occur, it will be time enough for a detailed criticism which, so far, appears to us to be unnecessary.

On the general question of the supersession of the existing boards of guardians by some improved form of local authority there will, we imagine, be no difference of opinion, although there may naturally be a good deal on the subject of the way in which the new authority should be constituted. It is unquestionable that the existing boards have been greatly weakened, alike in the eyes of the public and in respect of actual administrative capacity, by the withdrawal from them of the *ex-officio* members who until lately exerted a wholesome restraining influence in many directions, and who supplied the boards with persons conversant with public affairs and trained in the conduct of public business. The practical result of the change has been to leave the local administration of the Poor-law too often in incapable hands, or in some localities in the hands of persons who have sought office for the purpose of corruptly profiting by it. Dr. Downes demurs to the proposal of the Majority Report to "sweep away all directly elected representation in this great field of local government," and perhaps he is right; but we believe there would be a general agreement among parochial medical officers with the opinion that the modern system of unmixed "directly elected representation" has not produced satisfactory results, and that the "guardians" produced by it have not, as a rule, been of quality adequate to a complete and enlightened discharge of the duties of their office, the importance and responsibility of which they have not always, perhaps even not frequently, appeared to be able to recognise. It must, on the other hand, be freely admitted that such recognition has not been too common among the electors, and that the polling, as a rule, has excited but a slender amount of public interest. We were well acquainted with the conditions which existed some years ago in an important provincial town, where party spirit ran high, and

where vacancies alike in the municipal council and in the board of guardians were eagerly contested upon political grounds alone. These contests became very expensive, and at length a compromise was arrived at. The Blues were slightly in the majority, but so slightly that they had to beat up all their votes for every contest, and even then were sometimes defeated. They said to the Yellows, "If you will leave us the council, we will leave you the board of guardians." The compromise was accepted, and the council became all Blue, while the board became all Yellow. But the Yellow guardians desired their position, not because they "cared for the poor," not as guardians but as local politicians, and this was well understood by the local press. The reporters attended the meetings of the board as well as those of the council, and the guardians unbosomed themselves of their opinions upon things in general—opinions which were carefully reported. This duty done, they went home to luncheon, leaving the consideration of medical relief and of other Poor-law problems to the vice-chairman and the clerk, two very worthy gentlemen. We believe it never occurred either to the guardians or to their fellow townsmen that they were culpably neglecting important duties which they had been elected to discharge.

It cannot be said, moreover, that the other elected members of various local authorities, district councils, and the like, have generally given evidence of having been educated up to the level of their duties, or of having utilised their powers for the effective diminution of many of the evils against which they are supposed to strive. It surely ought not to be beyond the wit of man to construct an authority in which the principle of "election" was sufficiently leavened by that of "selection" to preserve the result from decomposition or decay, and to provide a body capable of moving, even if only with tardy and reluctant steps, in the directions pointed out by the growth of science and the advancement of knowledge. The great problem of sickness among the poor would not be insoluble if it were approached with adequate knowledge of its causes and of its results. The difficulties of dealing with it have been greatly increased by the neglects or the misconceptions of the past, but they ought not to be incapable of removal by adequately instructed and continued effort based upon knowledge. And whether we endorse or reject the recommendations of either the Majority or the Minority Report of this Commission we must all allow that the inquiry has brought together an amount of exact information which should prevent the plea of ignorance being pleaded as an excuse for inactivity.

UNIVERSITY OF LONDON.

A MEETING of the Faculty of Medicine of the University of London was held at the University on Friday, March 12th, Dr. SIDNEY H. C. MARTIN, Dean of the Faculty, being in the chair.

Professor E. H. Starling was re-elected a representative of the Faculty on the Senate.

The following report of the Board of Advanced Medical Studies upon the subject of inspection in midwifery adopted at its meeting on Feb. 12th was received and adopted:—

The subjects in which certificates of practical instruction are required are:—(1) Practical midwifery (dummy manipulations, &c.); (2) attendance on maternity cases; (3) clerking or attendance in gynæcological wards or out-patient room. In the case of (1) and (3) the course of instruction is capable of inspection. In the case of (2) this is impossible, as the work takes place in the patients' own houses, and not at stated hours; and information can be gained only by inquiry. A difficulty arises from the variety of the requirements of the licensing bodies. In order to make inspection practicable, it would be advisable that representatives of the licensing bodies should meet and draw up a schedule of points on which they require information.

The licensing bodies might then empower a visitor or visitors to inspect the courses of instruction over the whole kingdom and to report upon them. In order to make such inspection of practical value, the visitor should be a person of considerable experience in the subjects of midwifery and gynæcology, and would require adequate remuneration.

Professor STARLING then proposed draft recommendations for a Board of the Faculty of Medicine, and certain paragraphs were passed, a consideration of the remaining paragraphs being postponed until another meeting. Professor Starling, in explaining his proposals, made some remarks which he had previously embodied in a "memorandum," which had been previously printed and circulated to the Members of the Faculty. This read as follows:—

The main object of the reconstitution of the University in 1898 was to make the University a teaching body by giving the teachers a voice and an influence in the determination of the curricula and in the examinations. In the Statutes of 1900 the method adopted to attain this object was the institution of Boards of Studies composed of teachers whom the Senate were bound to consult on all subjects concerning the curricula and examinations. The recommendations of these bodies are considered by the Senate only after receiving a report on them from the Academic Council or External Council according as the recommendations affect internal or external students respectively.

To the Faculties the only statutory power accorded is the election of 16 members of the Senate, members who also form part of the Academic Council. On the Academic Council there falls the task of coördinating the recommendations of the various boards within the purview of each Faculty, and of formulating definite recommendations to the Senate with regard to the Faculty as a whole. Since the Academic Council includes representatives from all Faculties, it has become customary for the affairs of each Faculty to be referred first to a subcommittee consisting of the representatives of the Faculty in question. The initiation of action in the internal affairs of the University so far as concerns medicine is therefore practically in the hands of the three representatives of the Faculty. These three are not trained administrators. They are not cognisant with all aspects of questions which arise concerning the Faculty of Medicine. They form only a small minority in the Academic Council. Where there is general agreement between all the Boards of Studies they are able to advise the Academic Council accordingly. Where there is disagreement they have not the knowledge or power which would enable them to decide between the divergent views, nor if they so decided could they speak with the authority necessary to impress their views on the rest of the Academic Council or on the Senate. Moreover, their time and energies are so fully taken up with routine business, such as modifications in the curricula, recognition of teachers, courses of study, &c., &c., that no time or energy is left for the working out of schemes for the development of the University Faculty of Medicine which have from time to time been put forward by the Faculty or the boards.

One of the weaknesses of the internal side of the University is the inadequacy of the Academic Council to perform duties which cannot possibly be carried out by any one body of men.

Is it possible to improve this condition of things? Any alteration in the mode of appointment of the Boards of Studies or of the Academic Council, or in the reference to these bodies, would amount to an alteration of the Schedule to the Act of 1898, which at present keeps the whole University in fetters. We cannot therefore expect any such alteration until the new Royal Commission has reported. It would, however, be possible to effect certain changes *by consent* (not by statute) which might bring about an improvement in the administration of the internal side of the University, and might be regarded as an experimental trial of a condition of things for which statutory authorisation might be hoped for under a new Act.

We cannot expect the medical side of the University to make any substantial progress until its academic direction is determined by those who are mainly responsible for its welfare—namely, the members of the Faculty of Medicine. At the present time the Faculty itself is too large and unwieldy a body to undertake administrative functions. Any attempt to rule the medical side of the University by a direct vote of the Faculty would result in important questions being decided by small groups of men who had the energy or leisure to whip up the holders of some particular view. On the other hand, its three representatives on the Academic Council are too few in number and not sufficiently representative of the varied interests involved to be able to carry on the work which is laid upon them.

The solution of the difficulty is probably to be found by adopting the suggestion of the Cowper Commission, and by intrusting the affairs of the Faculty to a "Faculty Board" to be elected by the Faculty, sufficiently numerous to include representatives of the various branches of study involved in the medical discipline, but not too large to act as a single advisory or executive body. It is to be hoped that such a body will in future be intrusted with actual executive functions in certain academic matters. At the present time all that the Faculty can do is to delegate its powers of advice to its Representative Board and to request the Senate to regard its delegates as the Faculty itself and as the chief advisory body in medicine. The Faculty Board would thus in practice take the place of the Subcommittee in Medicine of the Academic Council, and would probably also render unnecessary the existence of the committee of the medical members of the Senate.

Method of Appointment.—At some future time, when the Faculties have more autonomy and are directed by their representative Boards, the nomination of Boards of Studies, which might be practically committees of the several Faculties, would lie with the latter. At present the Boards of Studies are the most important academic bodies provided for by Statute. The Faculty Board would therefore have to be in the first place representative of the various Boards of Studies in the Faculty, care being taken by the proper proportioning of the numbers of representatives from each Board and by the addition of members directly elected by the Faculty to ensure that the opinion of the Faculty Board should really represent the opinion of the Faculty as a whole. A Board of 24 to 30 would be workable in size and might have somewhat the following constitution:—

One representative of each of the subjects: Chemistry, Physics, Biology, Pharmacology, Ophthalmology, Hygiene, Mental Diseases, Dentistry = 8.

Two representatives of each of the subjects: Anatomy, Physiology, Pathology, Gynæcology = 8.

Five representatives each of Medicine and Surgery = 10.

This would give eight members of the Board representing the Preliminary and Intermediate Medical Studies and 18 representatives of the Advanced Studies. In a body of this size it should be possible to secure representation on the Board of every School of the University. The Board would have to meet regularly at least once a month in order to get through the business, and it would therefore be essential to elect only such men as are able to devote this amount of time to the work of the Faculty.

The following series of resolutions are designed for the purpose of carrying these alterations into effect. It is important to remember that the Faculty, in carrying these or similar resolutions and making a bid

for Home Rule in the Faculty, would be practically requesting the Academic Council to abrogate certain of its powers in favour of a Board which is not recognised by the present Statutes. The change therefore can only be carried out by consent of the Senate and its councils, and if the recommendations of the Faculty are to have sufficient weight with the Senate to persuade this body of their advisability, it is essential that they should be carried by a large majority at a full meeting of the Faculty, and not, as usually happens, by a chance majority at a meeting which only just exceeds the necessary quorum. The question is vital for the future of the Medical School of London, and is much more important than the election of one or another individual as a representative on the Senate. It is hoped, therefore, that the members of the Faculty will make a special effort to attend the meeting at which these resolutions will be brought forward.

The recommendations passed at this meeting were the following:—

1. That, for the more efficient carrying out of the academic work of the University, a Board of the Faculty of Medicine be appointed.
2. That the Board of the Faculty of Medicine be appointed in accordance with the following scheme:—

A.

The Board shall consist of:—
(i.) The Dean of the Faculty of Medicine, who shall be *ex officio* Chairman of the Board.
(ii.) The Secretary of the Faculty of Medicine, who shall be *ex officio* Secretary of the Board.
(iii.) The Chairmen of the Boards of Studies in the following subjects:—Preliminary Medical Studies, Intermediate Medical Studies, Advanced Medical Studies, Dentistry, Hygiene and Public Health, Physiology and Experimental Psychology, Human Anatomy and Morphology.
(iv.) Two representatives of the Board of Preliminary Medical Studies to be appointed from the Members of the Faculty by the Faculty after report from the Board in question.
(v.) Two representatives of the Board of Intermediate Medical Studies to be appointed from the Members of the Faculty by the Faculty after report from the Board in question.
(vi.) Six representatives of the Board of Advanced Medical Studies to be appointed from the Members of the Faculty by the Faculty after report from the Board in question.
(vii.) Four Members to be elected from the Faculty by the Faculty, each such Member to be nominated by not less than two Members of the Faculty.
(viii.) The three representatives of the Faculty of Medicine on the Senate.
(ix.) The two Members of the Senate appointed by Convocation on the election of the registered graduates in Medicine and in Surgery.
(x.) All Members of the Faculty of Medicine not included in the foregoing categories who are also Members of the Senate.
(xi.) The Representative of the University on the General Medical Council.

B.

The quorum of the Board shall be ten.

The meeting then stood adjourned.

KING EDWARD'S HOSPITAL FUND FOR LONDON.

THE annual meeting of the General Council of King Edward's Hospital Fund for London, to receive and adopt the accounts and the report for the year 1908, was held at Marlborough House on March 10th, His Royal Highness the PRINCE OF WALES, President of the Fund, being in the chair.

Lord ROTHSCHILD, the honorary treasurer, in presenting the account of receipts and expenditure and the balance-sheet for the year ending Dec. 31st, 1908, called attention to the fact that the income from investments included a bonus dividend of £17,000, on securities given by Lord Mount-Stephen and Lord Strathcona.

The PRINCE OF WALES moved the adoption of the accounts. This was seconded by Sir EDGAR SPEYER, and carried unanimously.

Sir SAVILE CROSSLEY (honorary secretary) presented the draft report of the council for the year 1908, which stated that:—

The total receipts for the year 1908 were £345,792 15*s*. This sum was made up as follows: Donations, £7888 7*s*.; contributions to capital, £113,695 6*s*.; annual subscriptions, £24,782 1*s*. 4*d*.; contribution of the League of Mercy, £19,000; from the Lewis estate, £32,500; legacies (including £65,768 3*s*. 4*d*. from the Lambert estate), £67,770 18*s*. 2*d*.; interest from investments (including a bonus dividend of £17,931 1*s*. 5*d*.), £78,956 2*s*. 6*d*.; together with £1000 from the trustees of the London Parochial Charities and £200 from the trustees of the Bawden Fund. The amount distributed was £140,000, including the £1000 intrusted to the Fund for distribution among convalescent homes by the trustees of the London Parochial Charities. In addition to this an amalgamation grant of £500 became due during the year and was paid. Since the inauguration of the Fund the amount spent on administration has been £1 4*s*. 8*d*. per cent. of the total amount received. During the year a further sum of £32,500 was received from the executors of the will of the late Mr. Samuel Lewis, making a total of £245,000, on account of the legacy of £250,000 left to the Fund. The estate of the late Mr. J. G. Lambert was finally wound up during the year and the residue, amounting to £65,768 3*s*. 4*d*., was brought into the books of the Fund. A further sum of £1400 was received on account of the residue of the estate of the late Mr. G. H. Heigham. The Fund has also to acknowledge further munificent donations of £100,000 from Lord Mount-Stephen and £10,000 from Lord Iveagh, which, in accordance with the wishes of the donors, have been placed to capital. The amounts received in donations and subscriptions, excluding gifts to capital, show, as compared with 1907, an increase of £2552 1*s*. 1*d*. The League of Mercy has contributed £19,000, being £1000 more than in the previous year. During the ten years of its existence the League has furnished in all £116,000 to the Fund. ..... The revised uniform system of accounts, which was drawn up in 1906 by the Fund in association with the Metropolitan Hospital Sunday Fund and the Hospital Saturday Fund, and which came into force on Jan. 1st, 1907, has proved to be of great value in facilitating comparisons of the financial position and relative cost of the different hospitals. ..... At the distribution meeting in December His Royal Highness the President drew attention to the necessity of an increase in the number of annual subscribers, and it is evident that a continuance of public support and the replacement by new subscribers of those whose contributions are lost through death or other causes must be secured if the progress hitherto made in the total amount distributed is to be maintained. Steps to this end are being taken. .....

The PRINCE OF WALES, in moving the adoption of the report, said: My Lords and Gentlemen,—You will all agree with me in thinking that we may congratulate ourselves upon the condition of the affairs of the Fund as described in the report. The completion of the negotiations for the amalgamation of the Hampstead and North-West London Hospitals will, I feel sure, be approved of by the charitable public, both as conducing to the better organisation of hospital accommodation in that neighbourhood and as one more step in the direction of economy of management. It will be remembered that the Orthopædic Hospitals were the first to combine, and it is satisfactory to know that the new buildings in Great Portland-street will be ready for occupation by the three amalgamated institutions in the course of this year. The report of the Poor-law Commission will receive our most careful consideration. I have now much pleasure in moving the adoption of the report.

The BISHOP OF SOUTHWARK seconded the motion, which was carried unanimously.

In the absence of the Earl of Bessborough (chairman of the executive committee), Mr. STUART-WORTLEY presented an interim report of the executive committee upon the question of rules and regulations, which was adopted.

Mr. HUGH C. SMITH moved, and the MASTER OF ELIBANK seconded, a vote of thanks to the Prince of Wales for presiding. The vote was carried by acclamation and

HIS ROYAL HIGHNESS briefly responded.

THE POOR-LAW MEDICAL OFFICERS' ASSOCIATION OF ENGLAND AND WALES AND THE REPORT OF THE POOR-LAW COMMISSION.

AT a meeting of the Council on March 11th the following resolutions were unanimously carried:—

"1. That this Council desires to express its grateful acknowledgment of the unanimous testimony borne by the Royal Commission to the value of the past services of Poor-law medical officers, and their recognition of the disadvantages under which they have laboured, and the inadequacy of their remuneration."

"2. That in the opinion of the Council it is impossible for Poor-law relief to be organised on a provident basis, as the only proper recipients of such relief are by reason of their poverty unable to contribute anything; that those able to contribute are proper objects for charitable assistance."

"3. That the Council views with disapprobation the proposal to draft the State poor on to provident medical institutions; that in their opinion it would result in converting the same into Poor-law institutions, mainly supported by the rates; that it would be disastrous to these institutions by driving away many, if not all, of that class for whom they were specially created. Further, that it would largely increase the number of the State poor by adding to them many of the poorer members of provident medical institutions, and by so doing would inevitably cause great injury to the whole medical profession, especially the practitioners in poor districts."

"4. That the council strongly condemns the proposal to make every medical practitioner a Poor-law medical officer, and it does so for the following reasons: (*a*) That it would be many times more expensive than the present system. (*b*) That the value of the work done could never be properly tested, as no system of Local Government Board inspection could deal with so widely extended an arrangement for Poor-law medical relief. (*c*) That it would largely tend to provide free medical relief to all poor persons, and to increase, rather than diminish, the pauperisation of the nation. (*d*) That the interests of the sick State poor would be far better attended to by a special service, the members of which were adequately paid, and whose work was capable of proper inspection."

"5. That the council strongly disapproves of the proposal to allow a poor person to claim State medical relief without the intervention of a relieving officer, or assistance officer; that it would be opening the door widely to gratuitous medical relief to all members of the poorer classes; that it is no part of the duties of a Poor-law medical officer to decide as to the right of a poor person to State relief, and as in any widely extended system it would be necessary to pay for the items of work done by the medical officer, it would be a direct incentive to the latter to admit too readily the claims of poverty. That for the protection of the ratepayer it is absolutely necessary that there should be a skilled lay officer to decide who are proper applicants for medical relief. That in thickly populated areas there is no hardship in requiring applicants to get an order from an assistance officer, and that instances of the deserving State poor being deterred from applying to the Poor-law medical officer through having first to obtain an order are in urban districts conspicuous by their rarity."

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

AN ordinary meeting of the Council was held on March 11th, Mr. HENRY MORRIS, the President, being in the chair.

The SECRETARY reported the visit of the Prince and Princess of Wales to the College on Feb. 15th, and the best thanks of the Council were given to the President for his Hunterian oration and he was requested to publish it.

The PRESIDENT reported that he had appointed Mr. F. Richardson Cross Bradshaw lecturer for the ensuing Collegiate year.

The PRESIDENT reported that Sir Gilbert Blane medals had been awarded to Staff-Surgeon Charles Rowley Nicholson, H.M.S. *Egmont*, 1906–07, and Staff-Surgeon Arthur William Bligh Livesay, H.M.S. *Bonaventure*, 1907.

It was resolved to modify the by-laws relating to the admission to the Fellowship of Members of 15 years' standing, and it was decided that the formula prepared for this purpose should be submitted to the Council for final approval at its next meeting. The formula for the admission of women to the examinations of the College was approved, and it was resolved to send it back to the committee in order that counsel's opinion may be taken thereon if necessary.

The President was reappointed the representative of the College in the General Medical Council for a period of five years from March 12th.

A letter was read from the Right Hon. Lord Cheylesmore offering to present to the College a life-size plaster cast of Queen Victoria's favourite dog "Eos." The offer was accepted with the best thanks of the Council.

A letter was read in which Professor A. H. Young resigned his examinership owing to ill-health. The Council accepted the resignation with regret, and Professor William Wright was appointed a substitute examiner in anatomy for the next Primary Examination for the Fellowship in May.

A committee was appointed to consider the questions connected with the petition of the British Medical Association for the grant of a charter of incorporation and to report to the Council.

Dr. Nicolas Weliamnoff of St. Petersburg, Privy Councillor of State, was admitted an Honorary Fellow of the College. He was nominated in 1900, at the time of the institution of the Honorary Fellowship, but he was then unable to attend. At the present time Dr. Weliamnoff is in London in attendance on the Empress Marie Feodorovna of Russia, and advantage was taken of the opportunity to admit him an Honorary Fellow.

Looking Back.

FROM

THE LANCET, *SATURDAY*, March 19th, 1831.

PRINCIPLES OF TREATMENT AND CURATIVE PROCESSES.*

It is said, "The instructed scribe will resemble the householder, who brings forth out of his treasure new things and old." The manner in which the ancients treated deafness is not unworthy of notice. Their remedies were chiefly external. I have collected the following list from several old authors.—*1. External applications*:—The leaves of the *dipsacum* and *jew's-ear*. *2. As injections*:—*Ale-hoof* or *ground ivy*: "The essence dropped into the ears helps the deafness or noise there"; *hyssop*: "It taketh away noise in the ear by injection."—*3. Tobacco*: "The essence of it made with wine being dropped into the ears helps deafness."—4. Juice of *poplar* or *aspen* tree.—5. Juice of *liquorice*, ℥ii; soft *bdellium*, ℥ss; sugar-candy, ℥ii, dissolved; juice of leeks, ℥iv; juice of celandine, ℥j, mixed and "dropt into the ears, helps imposthumes, noise, and pain there."—6. *Common turpentine, turpentine of the larch*: a combination of turpentine, olive oil, essential oils, and sulphur, was used with "happy success."—7. *Urine* of *men* and *animals*, dropt into the ears.—8. "The *galls* of all creatures," says Salmon, are "specifics for deafness, noise, and pain in the ears, with running matter. Of beasts the bull's gall is the strongest, and of birds, that of the partridge and heron, the gall of birds being accounted stronger than that of beasts. Waters, extracts, or tinctures, may be made of them, but the most famous is the tincture or powders of ox-gall." (*The preparations now commonly used by aurists.—F.*) An "extract made of human gall and ox-gall mixed with breast-milk, dropt into the ear, being stopped with cotton dipt into the same cures pain and noise in the ears. Dog's gall dropt in warm goat's milk, with honey, wolf's, mice's, to bring out insects; bull's, mixed with honey or balsam, sheep's, with breast-milk, and injected with a syringe," are all recommended by the old authors. Such is the origin of the nostrums which aurists and "auld wives" now prescribe.—9. *Miscellaneous*: Powdered horse-dung (which contains ammonia), fat of dormice, lion's brains made into an oil, musk put into the ears stopped with cotton, heron's and goose grease, *hog's lice* and *earwigs* (!) boiled in oil and mingled with hare's urine, and put into the ears morning and evening." Moths. *As masticatories* and *errhines*:—Masticatories of mastich, pyrettrum, cummin, and cloves, twice a day, and errhines of the betonica and melissa, aa., ℥ss; vel. alb. aa., ℥i, M. To be drawn up the nostrils in fragments.

* Excerpt from "Practical Observations on the Pathology and Treatment of Deafness." No. V. By John Fosbroke, M.D., Cheltenham.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

IN 76 of the largest English towns 8686 births and 6972 deaths were registered during the week ending March 13th. The annual rate of mortality in these towns, which had steadily increased in the four preceding weeks from 17·5 to 21·3 per 1000, further rose to 22·1 during the week under notice. During the first ten weeks of the current quarter the annual death-rate in these towns averaged 18·5 per 1000, and in London the mean rate during the same period was equal to 19·2 per 1000. The lowest recorded annual death-rates in these towns during last week were 10·9 in Hornsey, 11·1 in Gateshead, 11·9 in East Ham and in Handsworth, and 12·9 in Grimsby; the rates in the other towns ranged upwards, however, to 27·0 in Birmingham, 29·0 in Bury, 34·6 in Brighton, and 35·1 in St. Helens. In London the recorded death-rate during the week was equal to

24·0 per 1000. The 6972 deaths from all causes in the 76 towns last week showed a further increase of 262 upon the rapidly increasing numbers in recent weeks, and included 634 which were referred to the principal epidemic diseases, against numbers increasing from 452 to 626 in the four preceding weeks; of these 634 deaths, 371 resulted from measles, 124 from whooping-cough, 58 from diphtheria, 34 from scarlet fever, 33 from diarrhœa, and 14 from "fever" (principally enteric), but not one from small-pox. The deaths from these epidemic diseases, in the week under notice, were equal to an annual rate of 2·0 per 1000, against rates increasing from 1·4 to 2·0 in the four preceding weeks; in London the recorded rate from these diseases was also equal to 2·0 per 1000. No death from any of these epidemic diseases was registered during last week in Huddersfield, Newport (Mon.), Hornsey, Ipswich, Hastings, or in Burton-on-Trent; the annual death-rate therefrom, however, ranged upwards in the other towns to 5·2 in Smethwick, 5·5 in Aston Manor, 6·5 in West Hartlepool, 7·2 in Warrington, and 15·9 in St. Helens. The fatal cases of measles in the 76 towns, which had steadily increased in the four preceding weeks from 188 to 350, further rose during the week under notice to 371 and caused annual death-rates equal to 4·0 in Birmingham, 4·7 in Sheffield, 4·9 in Aston Manor, 6·5 in West Hartlepool, 7·2 in Warrington, and 12·6 in St. Helens. The 124 deaths from whooping-cough also showed a slight further increase upon the numbers in recent weeks; the highest annual rates from this disease last week were 2·0 in Great Yarmouth, 2·5 in Southhampton and in Wolverhampton, 2·6 in Bury, and 2·7 in St. Helens. The 58 fatal cases of diphtheria, however, showed a further decline from the numbers in the five preceding weeks, but included 25 in London and its suburban districts, five in Hull, and three both in Manchester and Salford and in Newcastle-on-Tyne. The 34 deaths from scarlet fever were fewer by nine than those returned in the previous week; they showed the highest proportional fatality in Northampton and Reading. The 33 deaths attributed to diarrhœa exceeded the number in the previous week by five; while the 14 referred to "fever" showed a further decline, and were fewer than in any previous week of this year. The number of scarlet fever patients under treatment in the Metropolitan Asylums and the London Fever Hospitals, which had been 2825 and 2873 at the end of the two preceding weeks, were 2870 on Saturday last; the new cases of this disease admitted to these hospitals during last week were 285, against 292 and 285 in the two preceding weeks. The registered deaths in London referred to pneumonia and other diseases of the respiratory organs, which had increased in the four preceding weeks from 441 to 703, further rose to 758 in the week under notice, and exceeded by 385 the corrected average number in the corresponding week of the five years 1904–08. The 101 deaths directly referred to influenza in London also exceeded the same corrected average by 53. The causes of 64, or 0·9 per cent., of the deaths registered in the 76 towns during the week were not certified either by a registered medical practitioner or by a coroner. All the causes of death registered during last week were again duly certified in Leeds, Bristol, West Ham, Bradford, Newcastle-on-Tyne, and in 42 smaller towns; the 64 uncertified causes of death in the 76 towns last week included, however, 12 in Birmingham, ten in Liverpool, and three both in St. Helens and West Bromwich.

HEALTH OF SCOTCH TOWNS.

The annual rate of mortality in eight of the principal Scotch towns, which had steadily increased in the four preceding weeks from 18·2 to 20·7 per 1000, further rose to 21·6 in the week ending March 13th. During the first ten weeks of the current quarter the annual death-rate in these eight towns averaged 19·2 per 1000, and exceeded by 0·7 the mean rate during the same period in the 76 large English towns. Among the eight Scotch towns the death-rate during the week under notice ranged from 15·2 and 20·4 in Leith and Edinburgh to 24·4 in Aberdeen and 27·9 in Perth. The 771 deaths from all causes registered in the eight towns last week showed a further increase of 33 upon the numbers returned in recent weeks, and included 96 which were referred to the principal epidemic diseases, against numbers steadily increasing from 73 to 91 in the four preceding weeks; of these 96 deaths, 55 resulted from whooping-cough, 23 from diarrhœa, 10 from diphtheria, five from scarlet fever, two from measles, and one from "fever," but not one from small-pox. These 96 deaths from epidemic diseases were equal to an annual rate of 2·7 per 1000, exceeding by 0·7 the mean rate during the week from the same diseases in the 76 English towns. The fatal cases of whooping-cough in the eight Scotch towns, which had been 40 and 67 in the two preceding weeks, declined again last week to 55, and included 37 in Glasgow, eight in Aberdeen, six in Edinburgh, and two in Paisley. The 23 deaths attributed to diarrhœa showed a marked increase, and exceeded the number in any previous week of this year; 14 were returned in Glasgow, three both in Dundee and in Aberdeen, and two in Edinburgh. The ten fatal cases of diphtheria, of which six occurred in Glasgow and two in Aberdeen, exceeded the number in the previous week by four. The five deaths from scarlet fever corresponded with the number in the previous week, including two in Dundee. Both the fatal cases of measles occurred in Aberdeen; and the one death referred to "fever" was returned in Glasgow. The deaths from diseases of the respiratory organs in the eight towns, which had steadily increased in the five preceding weeks from 131 to 174, were last week 173, and exceeded by 31 the number returned in these towns in the corresponding week of last year. The causes of 23, or 3·0 per cent., of the deaths registered in the eight towns last week were not certified; in the 76 large English towns the proportion of uncertified causes of death last week did not exceed 0·9 per cent.

HEALTH OF DUBLIN.

The annual rate of mortality in Dublin, which had been equal to 24·3 and 26·6 per 1000 in the two preceding weeks, further rose to 27·5 in the week ending March 13th. During the first ten weeks of the current quarter the death-rate in the city averaged 25·2 per 1000, whereas the mean rate during the same period did not exceed 19·2 in London and 18·3 in Edinburgh. The 210 deaths of Dublin residents from all causes during the week under notice showed a further increase of seven upon the numbers in recent weeks, and included 17 which were referred to the principal epidemic diseases, against 17 and 15 in the two previous weeks. These 17 deaths were equal to an annual rate of 2·2 per 1000; the rate from these epidemic diseases in the same week was equal to 2·0 in London and to 1·3 in Edinburgh. Of the 17 deaths from these epidemic diseases in Dublin last week five resulted from measles, five from whooping-cough, three from "fever," two from diphtheria, and one each from scarlet fever and diarrhœa, but not one from small-pox. The fatal cases of whooping-cough and "fever" showed an increase upon the numbers in the previous week, while those of diphtheria had declined. The 210 deaths registered during the week included 42 of infants under one year of age and 71 of persons aged upwards of 60 years; both these numbers considerably exceeded the numbers returned in the previous week. Four inquest cases and two deaths from violence were registered last week; and 65, or 31·0 per cent., of the deaths occurred in public institutions. The causes of 11, or 5·2 per cent., of the deaths registered in Dublin last week were not certified; in London the causes of all but one of the 2221 registered deaths were duly certified, while in Edinburgh 3·6 per cent. of the causes of death were not certified.

VITAL STATISTICS OF LONDON DURING FEBRUARY, 1909.

IN the accompanying table will be found summarised complete statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. With regard to the notified cases of infectious diseases, it appears that the number of persons reported to be suffering from one or other of the nine diseases specified in the table was equal to an annual rate of 6·4 per 1000 of the population, estimated at 4,833,938 persons in the middle of the year; in the three preceding months the rates were 9·2, 7·6, and 7·2 per 1000 respectively. The lowest rates last month were recorded in Kensington, St. Marylebone, St. Pancras, Stoke Newington, the City of London, and Southwark; and the highest rates in Hackney, Shoreditch, Stepney, Poplar, Lewisham, and Woolwich. Scarlet fever was

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING FEBRUARY, 1909.

(Specially compiled for THE LANCET.)

CITIES AND BOROUGHS.	Estimated population in the middle of 1908.	NOTIFIED CASES OF INFECTIOUS DISEASE.											DEATHS FROM PRINCIPAL INFECTIOUS DISEASES.													
		Small-pox.	Scarlet fever.	Diphtheria.*	Typhus fever.	Enteric fever.	Other continued fevers.	Puerperal fever.	Erysipelas.	Cerebro-spinal meningitis.	Total.	Annual rate per 1000 persons living.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.*	Whooping-cough.	Typhus fever.	Enteric fever.	Other continued fevers.	Diarrhœa.	Total.	Annual rate per 1000 persons living.	Deaths from all causes.	Death-rate per 1000 living.	Deaths of Infants under one year to 1000 births.
LONDON	**4,833,938**	**3**	**1260**	**645**	**—**	**119**	**1**	**22**	**322**	**4**	**2376**	**6·4**	**—**	**306**	**36**	**75**	**104**	**—**	**17**	**—**	**52**	**590**	**1·6**	**6858**	**18·5**	**107**
West Districts.																										
Paddington	151,955	—	44	16	—	4	—	—	8	1	73	6·3	—	3	1	1	5	—	—	—	3	13	1·1	181	15·5	125
Kensington	183,683	—	32	14	—	5	—	—	11	—	62	4·4	—	4	—	2	5	—	2	—	5	18	1·3	251	17·8	110
Hammersmith	125,704	—	21	15	—	2	—	2	8	—	48	5·0	—	2	1	—	5	—	—	—	2	10	1·0	175	18·1	88
Fulham	176,406	—	19	38	—	5	—	2	12	—	76	5·6	—	6	—	8	3	—	—	—	2	19	1·4	222	16·4	103
Chelsea	75,249	—	17	6	—	2	—	—	5	—	30	5·2	—	2	2	2	1	—	1	—	1	9	1·6	110	19·1	157
City of Westminster	168,883	—	38	18	—	1	—	1	7	—	65	5·0	—	5	2	3	3	—	1	—	2	16	1·2	253	19·5	90
North Districts.																										
St. Marylebone	126,027	—	17	10	—	3	—	—	11	—	41	4·2	—	2	1	1	3	—	—	—	1	8	0·8	203	21·0	75
Hampstead	94,185	—	31	4	—	2	—	—	1	—	38	5·3	—	—	1	—	—	—	—	—	—	1	0·1	97	13·4	80
St. Pancras	237,422	—	39	24	—	—	—	—	5	—	68	3·7	—	19	1	3	5	—	—	—	3	31	1·7	359	19·7	108
Islington	351,202	—	105	34	—	7	—	1	11	—	158	5·9	—	19	3	2	9	—	2	—	2	37	1·4	462	17·1	89
Stoke Newington	54,423	—	10	1	—	2	—	—	1	—	14	3·4	—	—	—	—	—	—	—	—	—	—	—	70	16·8	68
Hackney	237,601	—	85	24	—	10	—	—	30	1	150	8·2	—	8	—	3	2	—	3	—	7	23	1·3	293	16·1	103
Central Districts.																										
Holborn	53,802	—	12	5	—	2	—	—	6	—	25	6·1	—	1	1	—	—	—	—	—	—	2	0·5	83	20·1	68
Finsbury	96,289	—	18	10	—	1	—	1	8	—	38	5·2	—	4	2	1	7	—	—	—	1	15	2·1	190	26·0	99
City of London	18,193	—	2	—	—	1	—	—	1	—	4	2·9	—	1	—	—	—	—	—	—	—	1	0·7	30	21·5	53
East Districts.																										
Shoreditch	114,802	—	37	16	—	12	—	2	13	1	81	9·2	—	24	2	1	8	—	—	—	—	35	4·0	227	25·8	147
Bethnal Green	131,316	—	31	16	—	3	—	1	6	—	57	5·7	—	11	3	2	4	—	—	—	1	21	2·1	214	21·2	154
Stepney	312,525	—	84	67	—	7	—	1	41	—	200	8·3	—	32	1	6	1	—	—	—	—	40	1·7	429	17·9	81
Poplar	171,965	—	71	16	—	7	—	3	10	—	107	8·1	—	15	4	2	2	—	1	—	4	28	2·1	234	17·7	129
South Districts.																										
Southwark	211,125	—	26	19	—	4	—	1	17	—	67	4·1	—	19	1	2	5	—	—	—	4	31	1·9	374	23·1	121
Bermondsey	127,569	—	28	27	—	4	—	—	8	—	67	6·8	—	54	2	1	4	—	—	—	—	61	6·2	272	27·8	169
Lambeth	324,188	2	80	32	—	4	—	2	18	1	139	5·6	—	14	1	8	7	—	1	—	4	35	1·4	470	18·9	95
Battersea	186,036	—	63	34	—	5	—	—	10	—	112	7·8	—	4	1	4	8	—	1	—	—	18	1·3	250	17·5	124
Wandsworth	297,646	—	94	36	—	12	1	3	16	—	162	7·1	—	5	3	3	7	—	1	—	2	21	0·9	360	15·8	119
Camberwell	283,022	1	66	45	—	8	—	1	22	—	143	6·6	—	16	1	7	4	—	1	—	2	31	1·4	408	18·8	110
Deptford	118,583	—	24	21	—	2	—	—	11	—	58	6·4	—	15	—	3	1	—	1	—	1	21	2·3	163	17·9	131
Greenwich	111,014	—	19	15	—	1	—	1	6	—	42	4·9	—	15	—	—	3	—	—	—	—	18	2·1	155	18·2	96
Lewisham	160,749	—	74	37	—	2	—	—	8	—	121	9·8	—	2	—	4	2	—	—	—	3	11	0·9	165	13·4	85
Woolwich	133,374	—	73	45	—	1	—	—	10	—	129	12·6	—	4	2	6	—	—	2	—	2	16	1·6	158	15·4	93
Port of London	—	—	—	—	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Including membranous croup.

again less prevalent than in other recent months; this disease was proportionally most prevalent last month in Hampstead, Hackney, Shoreditch, Poplar, Battersea, Wandsworth, Lewisham, and Woolwich. The Metropolitan Asylums Hospitals contained 2766 scarlet fever patients at the end of last month, against 3787, 3498, and 3147 at the end of the three preceding months; the weekly admissions averaged 283, against 477, 371, and 343 in the three preceding months. The prevalence of diphtheria showed no variation from that recorded in the preceding month; among the several metropolitan boroughs this disease was proportionally most prevalent in Fulham, Stepney, Bermondsey, Battersea, Deptford, Lewisham, and Woolwich. There were 1152 diphtheria patients under treatment in the Metropolitan Asylums Hospitals at the end of last month, against 1228, 953, and 1182 at the end of the three preceding months; the weekly admissions averaged 133, against 158, 143, and 136 in the three preceding months. Enteric fever has shown a continued decline during the past three months; this disease was proportionally most prevalent last month in Stoke Newington, Hackney, Holborn, Shoreditch, Poplar, and Wandsworth. The number of enteric fever patients under treatment in the Metropolitan Asylums Hospitals, which had been 184, 147, and 126 at the end of the three preceding months, had further declined to 124 at the end of last month; the weekly admissions averaged 17, against 29, 16, and 18 in the three preceding months. Erysipelas was proportionally most prevalent in St. Marylebone, Hackney, Holborn, Finsbury, Shoreditch, Stepney, and Deptford. The 22 cases of puerperal fever notified during the month included three which belonged to Poplar, three to Wandsworth, two to Hammersmith, two to Fulham, two to Shoreditch, and two to Lambeth. The four cases notified as cerebro-spinal meningitis belonged respectively to Paddington, Hackney, Shoreditch, and Lambeth.

The mortality statistics in the table relate to the deaths of persons actually belonging to the various boroughs, the deaths occurring in institutions having been distributed among the boroughs in which the deceased persons had previously resided. During the four weeks ending Feb. 27th the deaths of 6858 persons belonging to London were registered, equal to an annual rate of 18·5 per 1000; in the three preceding months the rates had been 14·6, 14·3, and 16·4 per 1000 respectively. The death-rates last month ranged from 13·4 in Hampstead and in Lewisham, 15·4 in Woolwich, 15·5 in Paddington, and 15·8 in Wandsworth, to 21·0 in St. Marylebone, 21·2 in Bethnal Green, 21·5 in the City of London, 23·1 in Southwark, 25·8 in Shoreditch, 26·0 in Finsbury, and 27·8 in Bermondsey. The 6858 deaths from all causes included 590 which were referred to the principal infectious diseases; of these, 306 resulted from measles, 36 from scarlet fever, 75 from diphtheria, 104 from whooping-cough, 17 from enteric fever, and 52 from diarrhœa, but not any from small-pox, from typhus fever, or from ill-defined pyrexia. No death from any of these diseases was recorded last month in Stoke Newington; among the other boroughs they caused the lowest death-rates in St. Marylebone, Hampstead, Holborn, the City of London, Wandsworth, and Lewisham, and the highest rates in Finsbury, Shoreditch, Bethnal Green, Poplar, Bermondsey, Deptford, and Greenwich. The 306 fatal cases of measles were equal to two and a half times the corrected average number in the corresponding period of the five preceding years; this disease was proportionally most fatal last month in Shoreditch, Stepney, Poplar, Bermondsey, Deptford, and Greenwich. The 36 deaths from scarlet fever showed no variation from the average number; among the several metropolitan boroughs the greatest proportional mortality from this disease was recorded in Chelsea, Finsbury, Shoreditch, Bethnal Green, Poplar, Bermondsey, and Woolwich. The 75 fatal cases of diphtheria were slightly in excess of the corrected average number; this disease was proportionally most fatal in Fulham, Chelsea, Lambeth, Camberwell, Deptford, Lewisham, and Woolwich. The 104 deaths from whooping-cough were 58 fewer than the corrected average; the highest death-rates from this disease were recorded in Paddington, Hammersmith, Finsbury, Shoreditch, Bethnal Green, Bermondsey, and Battersea. The 17 fatal cases of enteric fever showed a slight excess over the corrected average number; of these 17 deaths, three belonged to Hackney, two each to Kensington, Islington, and Woolwich, and one to each of eight other boroughs. The 52 deaths from diarrhœa were 12 below the corrected average; this disease was proportionally most fatal in Paddington, Kensington, Hackney, Poplar, Southwark, and Lewisham. In conclusion, it may be stated that the aggregate mortality in London last month from these principal infectious diseases was 27·5 per cent. above the average.

Infant mortality, measured by the proportion of deaths among children under one year of age to registered births, was equal to 107 per 1000. The lowest rates of infant mortality were recorded in St. Marylebone, Hampstead, Stoke Newington, Holborn, the City of London, Stepney, and Lewisham; and the highest rates in Paddington, Chelsea, Shoreditch, Bethnal Green, Poplar, Bermondsey, and Deptford.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE following appointments are notified:—Fleet-Surgeons: T. C. Meikle to the *King Edward VII.*, on recommissioning; F. Fedarb to the *Hibernia;* and R. Hill to the *Dreadnought*, on recommissioning. Staff-Surgeons: W. E. Mathew to the *Berwick*, on commissioning; J. W. Craig to the *Cochrane*, on recommissioning; and G. E. Duncan to the *Sentinel*. Surgeons: E. A. G. Wilkinson to the *King Edward VII.*, on recommissioning; G. W. M. Custance to the *Hibernia;* H. Stone to the *Berwick*, on commissioning; J. R. A. Clark-Hall to the *Research*, on recommissioning; A. L. Robinson to the *Dreadnought*, on recommissioning; and T. E. Blunt to the *Halcyon*, on recommissioning.

ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel J. B. Wilson has been appointed to the Royal Herbert Hospital at Woolwich and Lieutenant-Colonel J. J. C. Donnet has been appointed to the Belfast District, for charge of the Military Hospital, Belfast. Lieutenant W. H. S. Burney has been selected for employment with the Egyptian Army.

INDIAN MEDICAL SERVICE.

Colonel R. W. S. Lyons has been appointed Principal Medical Officer, Abbotabad and Sialkote Brigades, *vice* Colonel J. McCloghry retired.

SPECIAL RESERVE.

Royal Army Medical Corps.

Surgeon-Major Edward C. Thompson, from the North of Ireland Imperial Yeomanry, to be a Major of the Special Reserve of Officers (dated July 7th, 1908). The undermentioned to be Lieutenants, on probation, of the Special Reserve of Officers (dated March 1st, 1909): James Neil McLaughlin, Robert Thin Craig Robertson, and Joseph Glaister McCutcheon.

TERRITORIAL FORCE.

Yeomanry.

Gloucestershire (Royal Gloucestershire Hussars): Surgeon-Major Herbert Bramwell is granted the honorary rank of Surgeon-Lieutenant-Colonel (dated March 31st, 1908).

Infantry.

4th Battalion, The Duke of Edinburgh's (Wiltshire Regiment): Surgeon-Major Herbert P. Tayler is granted the honorary rank of Surgeon-Lieutenant-Colonel (dated March 31st, 1908).

Royal Army Medical Corps.

Lowland Mounted Brigade Field Ambulance: Major Robert T. Halliday to be Lieutenant-Colonel (dated Jan. 11th, 1909). Captain Hugh W. Thomson to be Major (dated Jan. 11th, 1909).

6th London Field Ambulance: Major Edward Lloyd-William, from the 3rd London Bearer Company, Royal Army Medical Corps (Volunteers), to be Lieutenant-Colonel, with precedence as in the Volunteer Force (dated April 1st, 1908). Major (Honorary Major in the Army) William Moyle O'Connor, from the Royal Army Medical Corps (Militia), to be Major (dated Sept. 20th, 1908). Captain Frederick Richard Miller, from the Royal Army Medical Corps (Territorial Force), to be Captain (dated Feb. 22nd, 1909). Captain John Wilfred Bird, from the Royal Army Medical Corps (Territorial Force), to be Captain (dated Feb. 22nd, 1909).

Lieutenant William Bain, from the 2nd London Bearer Company, Royal Army Medical Corps (Volunteers), to be Lieutenant, with precedence as in the Volunteer Force (dated April 1st, 1908).

3rd South Midland Field Ambulance: Cyril Claude Lavington to be Lieutenant (dated Jan. 15th, 1909).

For attachment to Units other than Medical Units.—Surgeon-Major Alfred Rees, from the Severn Division (Electrical Engineers), Royal Engineers (Volunteers), to be Major, with precedence as in the Volunteer Force (dated April 1st, 1908). Surgeon-Captain and Honorary Surgeon-Major Richard Charles Maron Pooley, from the 5th Middlesex (West Middlesex) Volunteer Rifle Corps, to be Captain with the honorary rank of Surgeon-Major, with precedence as in the Volunteer Force (dated April 1st, 1908). Captain and Honorary Surgeon-Major Richard C. M. Pooley to be Major (dated April 2nd, 1908). Major Charles Averill to be Lieutenant-Colonel (dated May 19th, 1908). Lieutenant Richard W. Brimacombe to be Captain (dated Feb. 1st, 1909). Captain James Malpas to be Major (dated Feb. 25th, 1909).

VOLUNTEER CORPS.

Rifle: 1st Volunteer Battalion, The Hampshire Regiment: Honorary Assistant-Surgeon Alfred Pern resigns his commission (dated March 31st, 1908).

DEATHS IN THE SERVICES.

Captain Frederick Hallam Hardy, R.A.M.C., at Aden on March 8th from sleeping sickness while on a voyage home from Nyassaland. In 1898 he went to British Central Africa as a civil surgeon, and served in the Southern Angoniland expedition (medal with clasp). In 1900 he became a lieutenant in the Royal Army Medical Corps, and was promoted to captain in 1903. In 1901 he took part in the expedition up the Gambia (mentioned in despatches).

THE CONQUEST OF MALTA FEVER.

A *Daily Mail* telegram, dated Malta, March 11th, states: "The triumph of the military authorities here over the 'Mediterranean fever' of Malta was celebrated yesterday by a ball given by the Army Medical Corps in the Military Hospital of Valetta, which was formerly the Hospice of the Knights of St. John. ..... There is not now in the whole hospital a single patient suffering from the fever."

Correspondence.

"Audi alteram partem."

THE SECTION OF ANÆSTHETICS OF THE ROYAL SOCIETY OF MEDICINE AND THE PROPOSED GENERAL ANÆSTHETICS BILL.

To the Editor of THE LANCET.

SIR,—I am desired by the staff of the Incorporated Dental Hospital of Ireland to send you the subjoined resolutions adopted unanimously at a meeting of that body held in Dublin on the 8th inst. I may inform you that the hospital staff composes 25 dentists (eight of whom hold additional medical qualifications) and 11 medical men, anæsthetists.

I am, Sir, your obedient servant,

GEO. M. P. MURRAY, Hon. Sec.

Incorporated Dental Hospital of Ireland, March 12th, 1909.

THE RESOLUTIONS.

That the members of the staff of the Incorporated Dental Hospital of Ireland, having had under consideration the General Anæsthetics Bill, 1908, as submitted by the Privy Council to the General Medical Council, do approve the general principles of the Bill, but are of opinion that the clauses relating to registered dentists should be modified.

They would respectfully point out that dental students, before they present themselves for their final examination, are required to produce evidence of having received instruction in general medicine, surgery, and physiology, as well as in the administration of anæsthetics; they are consequently of opinion that if the course of instruction in the latter subject were made identical for medical and dental students, the same privileges could with perfect propriety be extended to dentists as are given to medical men by Clause I. of the Bill. In order to give effect to these proposals they would suggest the following amendments to the Bill:—

(1) That Clause 1 should read as follows: That any person other than a legally qualified medical practitioner registered under the Medical Acts, *or legally qualified dental practitioner registered under the Dentists Act, 1878*, who shall wilfully administer or cause to be administered to any other person by inhalation or otherwise any drug or substance, whether solid, liquid, vaporous, or gaseous, and whether pure or mixed with any other drug or substance with the object of producing a state of unconsciousness during any medical or surgical *or dental* operation, act, or procedure, or during childbirth, shall be liable on conviction before a court of summary jurisdiction for such offence to a penalty not exceeding £10, and in the case of a second or subsequent conviction to a penalty not exceeding £20, provided always that a person shall not be liable to a penalty under this section if in conducting such administration he was acting under the immediate direction and supervision of a legally qualified medical *or dental* practitioner, or if the circumstances attending the administration were such that he had reasonable grounds for believing and did believe that the delay which would have arisen in obtaining a legally qualified medical *or dental* practitioner would have endangered life.

(2) That Clause 2 be amended as follows: All *licensing bodies in the United Kingdom* recognised by the General Council of Medical Education and Registration of the United Kingdom shall require that all candidates, *both medical and dental*, before presenting themselves for their final examinations shall have received thorough theoretical and practical instruction in anæsthetics, and shall have personally administered anæsthetics, under the supervision and to the complete satisfaction of their respective teachers.

(3) That Clause 3 be deleted.

That no legislation which does not deal with local anæsthetics will adequately meet the mischief against which the General Anæsthetics Bill is aimed.

To the Editor of THE LANCET.

SIR,—The discussion as to the propriety of a dental surgeon administering an anæsthetic is one that must be largely guided by environment; necessity knows no law, and while in large centres an anæsthetist may more or less readily be found, such a luxury is, of course, out of the question in more remote districts. Few qualified dentists (by that is implied one who has taken a diploma on the basis of a curriculum) would care to administer a prolonged anæsthetic such as ether save in a case of great necessity, but, putting that on one side, personally I should prefer to be anæsthetised by nitrous oxide under the care of the average dental practitioner than of the average medical man. Doubtless my dental *confrères* have had a similar experience, but I have frequently been asked by surgeons to administer for them nitrous oxide where the period of anæsthesia required was brief, the operations ranging from the opening of an abscess to the re-fracture of a badly uniting humerus.

Once or twice in the last 25 years I have had rather curious experiences when associated with the patient's "own medical man," who, apart from the confidence he instils into the mind of his client, is of little use and often a good deal in the way. A lady on one occasion arrived, having bargained with her medical attendant that he was to administer the gas. When it is explained that he was totally ignorant of the apparatus he was about to use (an ordinary Clover face-piece) the success of the performance may readily be imagined and his absence would have been a benefit to all concerned, for, as was to be expected, the gas and not the man was blamed. Anyone who has been fortunate enough to have escaped accident in association with anæsthetics cannot be too grateful, and it is in this spirit that I recall the only moments of discomfort ever experienced while a patient was under the influence of nitrous oxide. Her own medical adviser was present, but beyond taking the pulse he took no active part in the administration of the gas. After the operation was completed and before the period of recovery had begun the patient's tongue slipped back sufficiently to interfere to a considerable extent with her breathing, so much so that a prolongation of the condition would ultimately have led to serious results. The medical mentor, who had up to this time been practically passive, struck the patient one or two resounding blows on the side of the head, recalling to one's mind a speedy and dangerous form of correction, and while he was meditating a second attack a pair of tongue forceps speedily brought relief. At a subsequent visit the patient informed me that she did not like gas as it had given her a violent headache!

No doubt single-handed administration, coupled with operation, has great disadvantages, but, great as they are, the comfort, if not the safety, of the patient is best obtained when the administrator is familiar with his work and knows what he should not do. Nitrous oxide has been administered millions of times by qualified dentists in the past, and there is no reason why the practice should not continue, as excellent instruction is, or ought to be, given in all our dental hospitals and schools. One learns with astonishment that the medical student is not similarly equipped, but this

must surely be the use and wont of hospitals far out of date and that therefore require that grandmotherly attention which some of your correspondents seem to be so anxious to bestow upon dentists.

I am, Sir, yours faithfully,

OSWALD FERGUS, L.D.S., F.R.S.E.

Glasgow.

PS.—In using the words "single-handed administration" the presence of an attendant is, of course, implied.—O. F.

THE THERAPEUTICS OF RADIUM.

To the Editor of THE LANCET.

SIR,—In your leading article on the Radium Institute in THE LANCET of March 13th, p. 773, you give the impression that radium has no curative effect on deep-seated or deeply extending growths. I hasten to correct this idea, for recent work in France has shown that by suitable filtration deep and extensive growths can be influenced. I have seen a case in which a large recurrent scirrhus of the breast had completely disappeared after treatment with filtered radiations and I have under my care at present a similar case which is rapidly improving with the same treatment. I will mention another recent case in my own practice, that of a man with an epithelioma of the larynx of slow growth, which was preventing the patient from swallowing, so that for a fortnight he had to be fed by a nasal tube. A tracheotomy had become necessary some time before. An application was given to the skin over the tumour of 50 milligrammes of pure radium bromide, encased in a silver tube of 0·6 millimetre thickness, which was placed in two different positions during the treatment. Three and a half days after the application was commenced he began to swallow liquids, and now, one week after, is beginning to take solid food by the mouth, nasal feeding being entirely discontinued. Beyond a little reddening of the skin there is no sign of any superficial action. It is too early as yet to say anything definite in this case; I merely mention it to show that radium has a deep action if properly employed. This action at a depth is obtained by using large quantities (from 50 to 100 milligrammes or more), filtering out all the less penetrating radiations and giving long exposures. The question whether a tumour will yield or not seems to depend more on its structures and clinical characters than anything else. It has also been found that a growth on which 20 milligrammes had no effect yielded to 50 milligrammes, and it seems probable that those growths which we cannot cure at present will be amenable to still larger quantities of radium.

I am, Sir, yours faithfully,

N. S. FINZI.

Welbeck-street, Cavendish-square, W., March 13th, 1909.

A DISCLAIMER.

To the Editor of THE LANCET.

SIR,—I have recently written certain articles on the medical aspects of accident insurance for the "Accident Year-book," published by the Insurance Publishing Company. I regret to see that in their advertisement of the book in certain insurance journals the publishers have advertised my name and mentioned my connexion with a large insurance company. They have done this without my knowledge or consent and I should be greatly indebted to you if you would publish this letter to free me from the suspicion of being a party to what might be regarded as a very objectionable form of advertisement of myself.

I am, Sir, yours faithfully,

ARTHUR S. MORLEY.

Gower-street, Bedford-square, W.C., March 13th, 1909.

PRESENTATION.—The members of the Glasgow University Club, London, have presented to Dr. C. O. Hawthorne a study table and microscope in recognition of his services as honorary secretary of the club during the past seven years. The presentation was made by Dr. A. Cumming Grant on behalf of the subscribers, many of whom were present. The company was entertained by Dr. and Mrs. P. H. Abercrombie who kindly placed their house at the disposal of the committee.

THE CHICAGO STOCKYARDS REVISITED.

(FROM OUR SPECIAL SANITARY COMMISSIONER.)

(Concluded from p. 795.)

THE INCREASED NUMBER OF INSPECTORS.—HOW VETERINARY SURGEONS ARE MADE TO "SPEED THE PACE."—WANT OF DIGNITY IN THE PROFESSION.—DEFECTIVE BUT SLIGHTLY IMPROVED SLAUGHTER FLOORS.—THE ABOMINATIONS OF THE QUARANTINE STATION, THE PENS, AND CATTLE-RUNS.

To analyse the new laws that have been enacted in response to the agitation against the Chicago stockyards would take much time and space and is not within the design of these articles. I am anxious to record my personal impressions on revisiting the stockyards now that better laws exist and improvements have been effected. But laws are not of much use unless there is an effective machinery for putting them into force. At the commencement of the year 1906 it was publicly stated that the Federal Government of the United States employed in the packing-houses of the entire country a total of 411 inspectors, and it was then calculated that if these inspectors were on duty for eight hours during 300 days in the year they would have to examine 105 animals per hour. Dr. A. D. Melvin, chief of the Bureau of Animal Industry, last October very courteously wrote to me, saying:—

> I also take pleasure in giving you the following figures concerning the Federal meat inspection: This inspection is conducted at 338 establishments at which animals are slaughtered. The total force employed numbers 2290, of whom 702 are veterinarians. The force at Chicago numbers 344, of whom 108 are veterinarians. These figures do not include clerks.

This simple statement of fact is eloquent and shows that much has been accomplished in a short time. Nevertheless and in spite the increase of the staff I could not but feel scandalised when I saw the manner in which the veterinarians and inspectors were made to work. The dignity of a scientific profession is entirely sacrificed to the necessity, or imagined necessity, for speed, and it is difficult to do good professional work under completely faulty conditions. Highly qualified men of science are made to hustle along in semi-darkness through filth and slush, ever "speeding the pace," the victims of a spirit of rush by which some efficiency must be lost. The giant engine is concealed in the darkness below ever churning and churning, turning hundreds of fly-wheels, transmitting its power to thousands of little wheels on which animals both dead and alive are suspended and move forward among the butchers, the dressers, and the skinners. While these animals, as they travel along, are being killed, flayed, and cut open the veterinary surgeon follows and inspects. So that this inspection shall not occasion any delay the labour is subdivided. The glands of the neck are hastily felt as the animal passes the first inspector; the viscera as they are cut out glide down a slope in front of a second inspector; and, finally, the carcass is looked into after the viscera have been removed as it passes the third inspector. The viscera of pigs have to be examined with such rapidity that a relief veterinarian stands behind the inspector to help him in case of exhaustion and delay. There was something so degrading about this unseemly haste that I could not help reflecting on the old condition of slavery in the Southern States, and wondering whether stricter servitude could have happened there and then. It was only necessary to place a man with a whip behind some of the veterinary inspectors to have a picture of slavery worthy of "Uncle Tom's Cabin." That ignorant immigrants should be driven to earn their living in revolting circumstances is as deplorable as it is inhuman, while every country has its way, or more than one way, of oppressing the hungry operative. These, alas, cannot help themselves. But surely such is not the case with members of a learned profession who have the honour of representing, as government functionaries, the wealthy United States of America. It is high time the veterinary surgeons in the employ of the United States Government should insist on being treated with due consideration, should refuse to be hurried in the way that they now are, or to do their work in dark, crowded, unclean places. They should insist on having all the leisure necessary to pause and to deliberate over any doubt that may arise in their minds, instead of having, as at

FIG. 9.

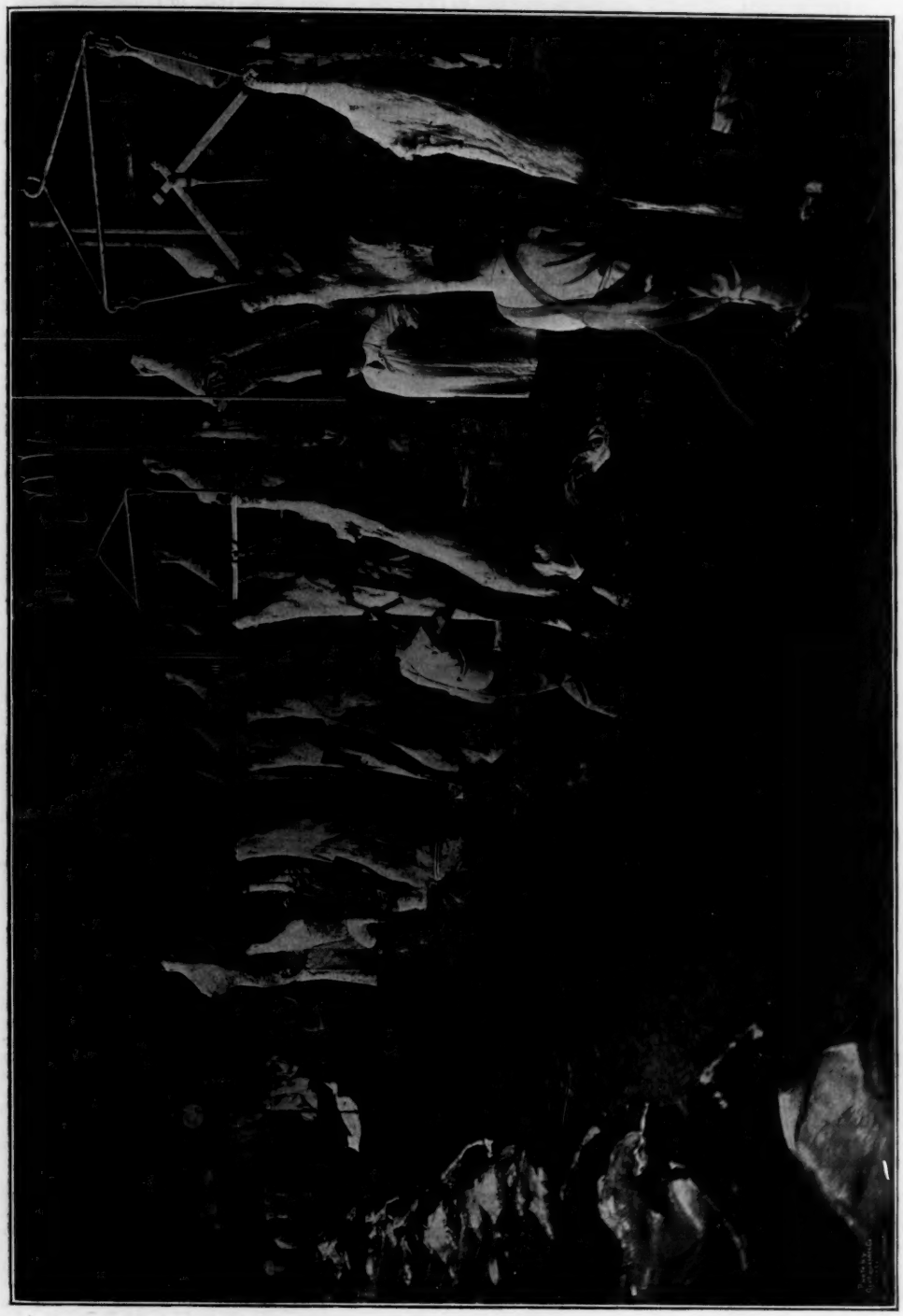


FIG. 9.

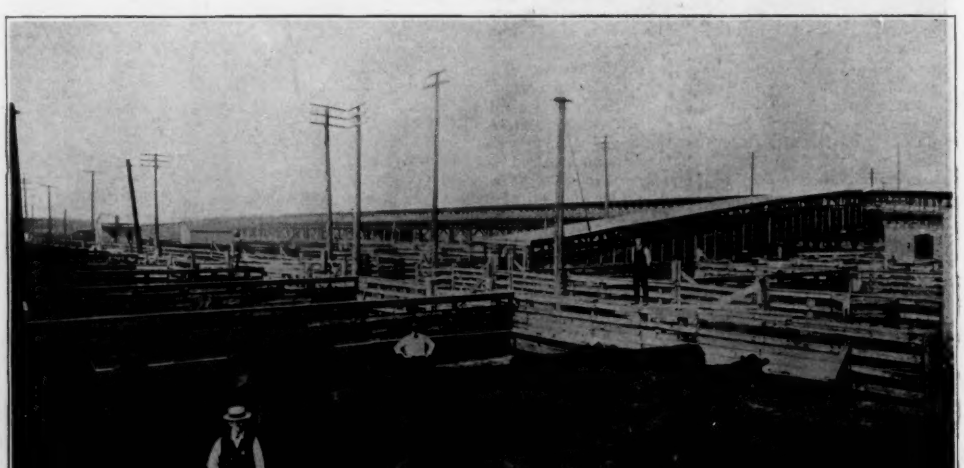
A crowded cattle-dressing floor. Insufficient light, but obvious improvements are present from the old conditions—viz., the steel instead of wooden overhead rafters and the concreted floor.

present, to keep pace with a machine. Also how can science progress if a scientific man is, by the subdivision of labour, kept all the year round doing exactly the same detail of post-mortem examinations? Veterinary inspection, as I saw it, clearly serves useful purposes, but it can only be really efficient by altering the conditions of the work.

On the killing floor for large animals the veterinary surgeon has to walk up and down examining the viscera. On one killing floor this meant, I was assured, that on ordinary days the inspector in going backwards and forwards walked from seven to eight miles, and when there was a great rush of work he might have to walk some ten miles. My general impression of the killing floors is that, on the whole, more light and air are admitted than used to be the case. There still remain many dark recesses and wide spaces where artificial light continues to be necessary even during the daytime, but there is real improvement. Many impervious bricks are now employed so as to render the floor watertight, and if it is suggested that this is not due wholly to a newly acquired consideration for public welfare the result is the same. The impervious floors prevent the contamination of the subsoil, and at the same time facilitate the collection of a larger quantity of blood, fragments, and grease that constitute marketable and valuable by-products. While the work is going on these floors are not flushed and washed every time they are soiled. They remain, at least to the end of the day, stained with blood and grease. The atmosphere becomes close, superheated, damp, stuffy, and ultimately foul odours predominate. There has been some improvement, but we are still far removed from the German standard of aseptic construction and management. Nor is there in Chicago anything like those palatial public abattoirs which the Germans boast can be visited in a dress suit. The circumstances are not, of course, quite comparable, but the knowledge of what can be done in Germany and of what is beginning to be done in other countries should spur the American to emulation, even though profits might temporarily be diminished.

One part of the stockyards, and it is by far the largest part, which has been left untouched in spite of all the agitation, comprises the 13,000 uncovered pens and the 8,500 covered and double-storeyed pens. The daily capacity of this enormous market is set down at 75,000 cattle, 125,000 sheep, 300,000 hogs, and 6000 horses. With such an accumulation in the one area of live-stock it would have been thought that the utmost precautions would be taken. All that has been done is to pave the ground more completely than formerly. The only excuse for not doing this sooner was that the bare earth was less likely to hurt the animals' feet. (Fig. 10.) The bare earth, however, could not be washed and was soon converted into muddy manure, which was certainly not good for the cattle. For miles and miles there stretch rough wooden palisades or railings dividing up the ground into square pens. To reach all these no less than 25 miles of roadways are necessary. Needless to say, these wooden partitions should be abolished and iron substituted. In the meanwhile they should be limewashed at frequent intervals, but even this elementary precaution is neglected. What, however, may be considered far more astounding is the condition of the quarantine station. When cattle come from a district where a contagious disease prevails the railway van that bears them is labelled "exposed." The cattle that have been exposed to infection are sent to a special platform, grandiloquently called the quarantine station (Fig. 11). Naturally I expected to find a broad platform made of concrete or other impervious material, well protected by iron railings, and a hose in various points of vantage so as to clean all the flooring at the passage of every suspected herd of cattle.

FIG. 10.



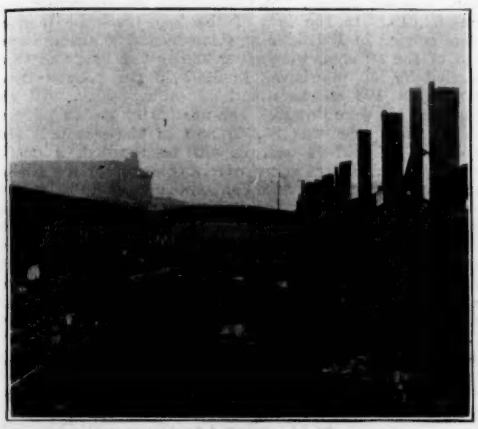
Open-air cattle pens divided by rough unpainted wood, unwhitewashed and porous. Overhead cattle runs in the background. It is here that ante-mortem inspection takes place in the open air.

To my intense surprise the platform was made of rough irregularly laid planks, fitting so badly that it would have been impossible to clean them properly had such an attempt been made. Instead of carefully painted iron railings to inclose the platform there were only rough wooden boards that were neither painted nor whitewashed. On all sides there were traces of manure and the railway lines stood over bare ground. Though some of the animals that land here are undoubtedly diseased no effort is made to secure some measure of cleanliness and to prevent their droppings drying on the platform and being blown as dust to the pens not far away where healthy cattle are kept.

After being landed on this germ-preserving platform—which I photographed, as otherwise it would be difficult to believe my description—the quarantined animals are brought to pens that are not only exactly like all the other pens but are close to them. Quarantine only consists of a roadway space that is but 15 feet broad. Here, again, I resorted to my camera so as to have a witness of this extraordinary arrangement. (Fig. 12.) At Frankfort, I remember, the whole of the railway system separated the quarantine slaughter-house and lairage from the ordinary slaughter-house and pens; and, further, no one was allowed

to go over from the one to the other. In other places—Breslau, for instance—there is a high and massive wall to cut off all communications with the quarantine section, or it may be a river or field that separates the two services. Here at the Chicago stockyards there is nothing whatsoever but 15 feet of space. The greater part of the pens are in the open air. There is no shelter whatsoever for the cattle, whether they are well or sick. This, considering the grave rigour of the winter at Chicago, must at times entail a great deal of suffering. In much milder climates, at the Paris cattle market and abattoir, for instance, the pens are roofed over with glass on an iron framework and,

FIG. 11.



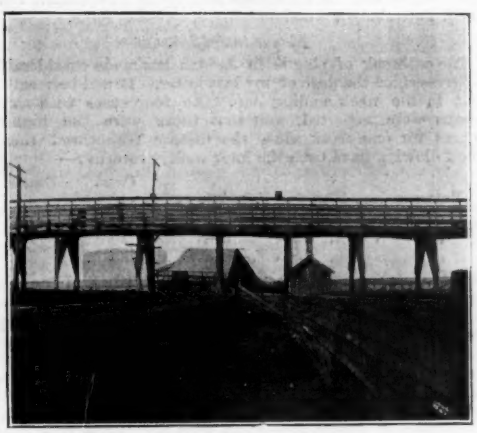
The "quarantine station" at the stockyards. Observe the narrow platform, the broken condition of the ground, and the rough unwhitewashed posts and planks. A cattle-run crosses the railway track.

of course, there are no wooden partitions. Still, it is considered necessary constantly to discharge superheated steam on the concrete flooring and the iron railings so as to sterilise as well as to clean them. If all the animals taken to Chicago were at once slaughtered, it might be said that, even if they did contract a disease from the insanitary condition of the stockyards it would not matter, for they would be killed before the period of incubation was over. But this is not the case. A large number of the animals sent to the Chicago stockyards are sold alive, brought away alive, and, especially in regard to cattle, a considerable proportion of them are shipped, I believe, to England. They land at Birkenhead or by the Ship Canal at Manchester, or they come up the Thames to Deptford.

If the open air pens expose the animals to all the rigour, the extreme heat and cold of the climate, the covered pens at the stockyards which I was able to visit are a perfect abomination. Here sheep are allowed to sleep on earth floors which are so saturated that a strong smell of ammonia prevails throughout. There is dust caked all over the rafters and ledges. The first covered pen I visited had not been cleaned out, so I was informed, for five months. Upstairs the first floor was also disposed as a sheep pen. Here there was more light, as it could come through the roof, but there was no drainage or washing attempted. Occasionally some of the manure was just shovelled out. The smell of ammonia was most offensive. It seems incredible, considering the number of modern model cattle markets that have been built in various parts of the world, that such filthiness should be tolerated in a progressive city like Chicago. It would seem simply as if the necessity of cleanliness was not acknowledged. The floors cannot be washed or they are not washed. There is no drainage whatsoever by which the liquid manure can escape. Therefore, the urine saturates the floors and the pungent odour of ammonia is ever present in the air. The rafters of the roofs are made of planks some eight inches broad and placed barely a foot apart. They are made of rough unpolished wood with little splints sticking out like bristles, which form an excellent frame-work to catch cobwebs which form nets that hold dust and dirt in suspension. Cobwebs abound on all sides and within easy reach, but no one has taken the trouble to remove them. There is on the upper floor of the pens I saw a good light and the air can circulate freely in hot or mild weather when the apertures are not closed. What happens in winter I cannot conjecture. The persons responsible for this structure should be made to live there and report on their sensations. In the drinking troughs there is an overflow pipe on a level with the top of the troughs. This overflow might have been used to make a current in the surface drains that should exist on the floors of all pens and stables. But in this case the water is wasted by being made to flow in a pipe and is lost outside.

Throughout the stockyards there are overhead cattle runs. Some of these are broad enough to serve as roads along which carriages can be driven. At various points a slope leads up to one of these runs and some of them reach so high as to bring animals to the top of some of the buildings where the killing floors are under the roofs. There is great traffic in these runs, consisting for the most part of numerous droves of cattle, sheep, or hogs. But though these thoroughfares are used by everybody it does not seem to be anybody's duty to keep them clean. This is all the more deplorable because, as usual throughout the stockyards, the chief material employed in their structure is wood. Nor is this polished wood, painted wood, or even whitewashed wood. On the contrary, it is impossible to go along the cattle runs without being impressed with the ramshackle appearance of these rough plank structures. The wood, struck by the hoofs and horns of numerous animals, splits and breaks. To touch it is to drive an unclean splinter into one's hand. It collects and hoards the dust of age with a plentiful admixture of animal manure. The latter is splashed about and clings tightly to the sides of these passages. There it remains for months till some passing animal is crushed up against the planks and scrapes off a little of the dirt with which they are besmirched. This dirt, maybe, will be conveyed to a killing floor, and if the animal is slaughtered and skinned near fresh meat some of the finer particles of this dirt will be blown over and on to such food.

FIG. 12.



The fifteen foot road-space here shown is the only separation between healthy cattle and those in quarantine. An overhead railway crosses it.

It will be seen, therefore, that there still remains much to be done at the Chicago stockyards before they can be compared with the standard now established for the construction of public cattle markets and abattoirs. Perhaps the trouble is that no model of such a structure exists in the United States. At New York I did visit a slaughter-house which had been pointed out as a model institution, but it could not be compared for one moment with what I have seen in Germany, Switzerland, or France. A much greater number of experts from the United States

should come and study these matters in Europe, but more especially in Germany. This seems indispensable, at least till such time as one or two proper and model abattoirs are constructed in the United States. Now that the spirit of reform has penetrated the Chicago stockyards and that some notable improvements have been effected, it is perhaps not too much to ask that the standard realised in Germany or at Basle in Switzerland should be introduced in the United States of America.

DISEASE IN THE NEAR EAST.

(FROM THE BRITISH DELEGATE ON THE CONSTANTINOPLE BOARD OF HEALTH.)

Cholera in Russia.

THE latest news received from Russia shows that the cholera infection is still present in certain parts of the country. The following figures are in continuation of those published in my last letter on the subject[1]:—

		Cases.	Deaths.
Between Jan. 10th (23rd)	and 17th (30th)	(Bulletin missing.)	
,, ,, 18th (31st)	,, 24th (Feb. 6th)	161	44
,, ,, 25th (Feb. 7th)	,, 31st (,, 13th)	144	42
,, Feb. 1st (14th)	,, 7th (20th)	116	40

It will be observed, however, that the figures show a tendency to diminish. In the first of the three weeks in question the disease was present only in St. Petersburg (which furnished 160 cases and 42 deaths out of the totals) and the Don Territory; in the second it was present in the same regions, and St. Petersburg contributed 142 cases and 41 deaths to the totals; and in the third the infected districts included not only the two above named but also the governments of St. Petersburg and Yaroslavl. The cases in the capital that week numbered 110 and the deaths 39. Practically all the rest of the country has been declared free from cholera, and even the Don Territory is declared "threatened" (instead of "contaminated") with the sole exception of the *arrondissement* of Taganrog. There is just the possibility that the infection may die out in the remaining month or two of cold weather, but the probability of its doing so is unfortunately small, and the existence of the disease in such widely separated parts of the country as those named and its continued activity in an epidemic form in St. Petersburg are undoubtedly disquieting facts.

Plague in Jeddah.

The outbreak of plague in Jeddah has made considerable progress since the date of my last letter. It will be recalled that in the week ending Jan. 30th four cases with three deaths were reported, and that those were the highest figures for one week since the disease reappeared there. The following have been the later weekly returns:—

	Cases.	Deaths.
Between Jan. 30th and Feb. 7th	18	17
Week ending Feb. 14th	17	11
,, ,, ,, 21st	10	12
,, ,, ,, 28th	23	21

Finally, on March 1st, there were five deaths and one case reported, and on March 2nd five deaths and two cases. These figures are, however, still below those recorded at the height of the outbreak in Jeddah in 1907. The disease has fortunately been confined to the native inhabitants of the town, and the pilgrims have almost entirely escaped. One pilgrim, however, contracted the disease there, and died in Mecca on Jan. 9th; he is said to have gone through the ceremonies at Arafat and Mina with the disease upon him and to have died after the return to Mecca. More recently—on Feb. 26th—a native of Jeddah died from plague in the desert on the road between Jeddah and Mecca; the body was taken to Mecca and buried there. Another exported case of the disease is also reported from the Suakin lazaret, where a pilgrim returning from the Hedjaz and undergoing quarantine in the lazaret was found on Feb. 1st to be suffering from plague. The patient was a Hadramuti. In each of these three instances there was no doubt that Jeddah was the source of the infection, and there can be no question that plague has within the last three years been truly endemic there, and the cause of an annual seasonal epidemic.

[1] THE LANCET, Feb. 20th, 1909, p. 577.

The 1907–08 Haj: Statistical and Medical Returns.

For the last few years it has been the custom of the Constantinople Board of Health to print (in addition to the statistical returns of the Pilgrimage, which have always been published) the annual reports of some of the medical officers at Camaran, Jeddah, and Mecca on the pilgrimage of the year. Those for the 1907–08 Haj have just been issued, and, taken together with the statistical returns, make very interesting reading. That year the number of pilgrims to the Hedjaz was exceptionally large, though it was exceeded in the previous year, when it would seem the totals were the highest on record—at any rate, within the last quarter of a century. In 1906–07 as many as 108,141 pilgrims arrived in the Hedjaz by sea; the number of those arriving by land is never known. In 1907–08 the corresponding total was 92,819. In the first of the two years the pilgrims were carried in 170 different steamers and 35 sailing ships; 135 of the steamers were under the British flag, and these carried 79,309 pilgrims. In 1907–08 the pilgrims were carried in 193 steamers and 37 sailing ships. Of the steamers 145 were British. The number of Indian pilgrims in the first year was 24,085 and in the second 18,651. The Haj of 1907–08 was, it will be recalled, a doubly infected one, cholera being widely epidemic in the Hedjaz and plague in Jeddah and Yanbo. Three cases of cholera were seen on each of two ships at the Camaran lazaret (the details were recorded in my former letters); the later reports confirm the view that these cases were not the source of the cholera epidemic in the Hedjaz, the infection of which came from the north. The number of pilgrims quarantined in the Camaran lazaret was 37,962 (as compared with a total of 44,334 in the preceding year). The mortality among them, both during the voyage and in the lazaret, was unusually high. During the voyage 163 deaths were recorded on the different ships, equal to a mortality rate of 0·43 per cent., which was about double the preceding year's figure. In the lazaret 240 pilgrims were ill enough to be removed to the lazaret's hospital; of these 102 died, giving a death-rate of 42·5 per cent.—an unusually high rate. Diseases of the lungs furnished 92 cases with 41 deaths; of these 44 cases and 15 deaths were due to lobar pneumonia—always a prevalent and fatal affection among pilgrims. Diseases of the digestive organs furnished 40 cases—mostly gastric and intestinal catarrhs in all their forms. Dysentery furnished 20 patients, of whom no less than 18 died. Eight of the cases were of amœboid origin; in none did liver abscess supervene. One case of sprue was seen. From malaria in all its forms 57 pilgrims suffered sufficiently to be sent to hospital and 8 died; 10 of the cases were pernicious. Small-pox was seen in only 2 cases, one of which died; in previous years the figures have been: 1903–04, no cases; 1904–05, 29 cases; 1905–06, 16 cases; and 1906–07, 2 cases. Typhoid fever (rare among pilgrims) was seen in an Indian; beri-beri in a Javanese; and among other diseases there were 2 deaths from sunstroke and one from cerebral hæmorrhage. Microscopical and bacteriological investigations were carried out in the case of the majority of patients admitted to hospital. In addition systematic observations were made of the intestinal excreta of about 200 pilgrims, sick and well, with a view to finding cholera-like vibrios. In 21 instances vibrios were found, but the details of the observations are reserved for a later report.

Constantinople, March 4th.

CONTRACT MEDICAL PRACTICE IN NORWAY.

(FROM AN OCCASIONAL CORRESPONDENT.)

A RECENT decision of a district council in the south of Norway to pay two medical men £250 each per annum out of the rates in return for free medical attendance to all has aroused a great deal of discussion, as it constitutes a decided step towards the socialisation of the medical profession. The full details of the proposal, which comes from the Socialist majority in the council, have not yet been published, but the principles involved are clear enough, and some such terms as the following are likely to be offered by the council to applicants for the post: 1. The medical officers who are appointed must live one in each

of the two main districts in the parish. 2. Patients in one district must notify to the medical officer living in that district if they should wish to be attended by his colleague. 3. Office hours are to be from 9 to 11 A.M. If called away at this time the medical officer must attend on his return to any patients who have called in his absence and are waiting for attendance. 4. The medical officers must be prepared at all hours to attend urgent cases. 5. Each medical officer shall undertake the whole practice on alternate Sundays. 6. The medical officers must keep their own horses and conveyances, which must be used without involving patients in any expense. Telephone expenses must also be defrayed by the medical officers. 7. The usual medical fees may be charged to strangers and travellers. Attendance on paupers is also to be paid for separately by the State as before. 8. Patients unless seriously ill must attend at the medical offices at the fixed time. If attendance is required in the patient's home, notice, except on urgent occasions, must be given in office hours. 9. The district council retains the right to alter these regulations at pleasure. The agreement between the district council and the medical officers can be cancelled on six months' notice from either side. The expenses which each medical officer would incur in the discharge of his duties have been estimated at £66.

Before approving of so revolutionary a measure, and one which, if taken, will probably be imitated in many other parts of the country, the Norwegian Medical Society has sought the opinion of all the branch societies throughout the country on this matter. The questions which have been put are as follows: "1. Is the principle of fixed salaries for medical men satisfactory both from the standpoint of the public and the profession? If the answer is in the affirmative, what terms should be sought with regard to (*a*) hours of work; (*b*) limitation of Sunday and night practice; (*c*) length of holidays; and (*d*) compensation for expenses in connexion with office, waiting-room, telephone, &c. 2. If the answer is in the negative, what other plan would be acceptable?" It would appear that the majority of the medical societies are practically unanimous in their condemnation of the suggested innovation. The report from Stavanger reads as follows:—"By the decision of the district council in question we have to face a new system of payment—a fixed annual salary—which, if introduced, will entirely revolutionise the status of medical men to such a harmful degree that we must at once resolutely oppose it. General practice is such trying and, regrettably enough, often such uninteresting work that we consider medical men cannot dispense with the stimulation afforded by separate payment and competition with their colleagues. Likewise, the view (generally unjustified, yet not uncommon among the public) that a medical man does not do his duty by the poor and members of sick clubs should be a warning against fixed salaries to include all medical attendance. If medical men have hitherto been at the beck and call of the general public both in and out of season, the new order of things would be still worse. All such decisions as, 'The medical officer must only be consulted during office hours, must not be called up at night unless necessary,' are, as we know, of no value so long as the decision as to what is or is not necessary rests with the public. Where the system has been tried—as, for example, in Bellinzona in Switzerland—the medical officers have been universally dissatisfied with it. It may be said that we already have in some cases fixed pay for our work, but such institutions as sick clubs are necessary evils which we allow owing to patients' poverty. The system of a fixed salary only could best be introduced in those districts with definite boundaries which supported only one medical man, but the calls on medical aid would undoubtedly grow to such an extent that it would be necessary in most places to secure for each medical officer a normal work day—a *sine quâ non* wherever Socialists are in power—and this would mean the appointment of an assistant and further expenses for the ratepayers. In districts such as the one in question where there are two or more medical men the system will cause many difficulties and disputes. If the choice of medical attendant be left to the public the more popular of the two officers will have more work than the other for the same pay. It is possible that the salary offered might be accepted by some medical men—e.g., the very young, or older but less active men—yet even if the terms of agreement could be satisfactorily arranged there is still this other consideration which should make the profession oppose such appointments resolutely—namely, the consideration due to the medical men who are not thus appointed. That the private practice of these men would be seriously harmed and their livelihood threatened requires no further demonstration. We are aware, for example, that among the Socialists of Stavanger there is a movement in favour of voting the sum of 20,000 kroner (£1111) for five medical men whose medical attendance should be free to the whole population of the town. These five, if appointed, would, of course, not be able to do all the work in the town, where there are at present 20 medical practitioners, but it is equally certain that they would be given a great deal of work at the expense of the private practice of their colleagues, whose livelihood would be threatened. We are convinced that the total income of the medical profession here would be cut down, while the amount of work done would be increased. Medical men are ready to support as far as possible all humane efforts to supply the poor with cheap and easily attainable medical attendance, but the plan in question is an attempt to supply rich and poor alike with cheaper medical attendance, and this we oppose." Similar sentiments are voiced by several other branch societies. From another quarter the protests against the proposed system are still more strongly worded.

The opinion of a large number of country practitioners is in favour of letting the matter remain in abeyance till the general meeting of the Medical Society in the summer or until the question of compulsory insurance against ill-health and accidents has been decided by the Storthing. A general refusal by the profession of the terms offered is already almost certain. But should the Socialists persist in their decision and advertise the two appointments it will remain to be seen whether any medical men will take them up in the face of the Medical Society's veto. Loyalty in the ranks of the profession is a prominent feature in Norway, and in a recent dispute over an appointment the Medical Society of Norway has shown itself to be a very powerful professional organisation.

BRISTOL.

(FROM OUR OWN CORRESPONDENT.)

Small-pox in Bristol.

BRISTOL is at present the scene of a small epidemic of variola and the inevitable attendant controversy about vaccination. The outbreak began in December of last year and has so far yielded 23 cases with three deaths. The first case, notified on Dec. 19th, was that of a man unloading barley from a ship at Portishead dock. No further case was detected (though perhaps a missed case intervened) till Jan. 10th, when a man living in a common lodging-house in the East-end of Bristol, after applying for relief, was sent to the workhouse, a journey unluckily accomplished in a tram-car. This man, the nature of whose case was recognised when he reached the workhouse, thus established at least 12 "contacts." These have been most vigilantly watched by the medical officer of health, Dr. D. S. Davies, who isolated and revaccinated them, and they have yielded 15 cases only. So far the matter seemed well under control, but recently affairs have taken a more disquieting turn. On Feb. 16th a man was admitted to the Cossham Hospital (situated at the eastern boundary of the city) from a neighbouring village suffering from symptoms the nature of which escaped recognition during the day or two that elapsed before his death. Subsequent events have shown that this was a case of hæmorrhagic small-pox, and he has infected at least seven people within the city and six outside. The latter include two of his children, a fellow workman, and his employer, while those within Bristol consist of five persons at the Cossham Hospital (all members of the administrative and nursing staff) and the two ambulance men who brought him there from his home. This same ambulance, between the date of its infection and that of the disinfection consequent on discovery of the nature of the case, carried 38 persons from various parts of the city to the different public institutions. Happily, all these persons have been under the direct supervision of Dr. Davies, and they have not produced any fresh case so far.

The body of the man who died at the Cossham Hospital was taken home and about 50 of his friends assembled to a kind of "wake," being, of course, still ignorant of the nature of his complaint. Small-pox is stated to have appeared in a neighbouring village. So much for the epidemic. To check it Dr. Davies has worked valiantly, watching and revaccinating "contacts" and publishing vaccination propaganda. Unfortunately, on Feb. 5th the board of guardians informed the Local Government Board by resolution that they did not see their way to promote revaccination, and in spite of the really serious aspect of the later stage of the outbreak they have remained of the same mind. The Local Government Board inspector, Dr. R. D. Sweeting, who attended a guardians' meeting on March 10th, entreated them to adopt a vigorous campaign of vaccination and revaccination, but they refused. In this situation it is interesting to record the recent vaccination statistics of the city. During 1907 8934 births were registered in Bristol and of this number 5505 were successfully vaccinated. 471 had certificates of conscientious objections and 19 were found insusceptible to vaccination. In the first six months of 1908 4543 births were registered and of these 2335 were successfully vaccinated, 524 had certificates of conscientious objections, and 26 were found insusceptible to vaccination.

Bristol General Hospital.

The governors of this institution held their half-yearly general board meeting on March 8th, the sheriff of Bristol, Mr. Stanley H. Badock, presiding. The annual report shows material progress but financial embarrassment. The year past saw the nurses' home completed, a practically new dental department begun, and an expert appointed to take charge of the department of pathology. The numbers of both in-patients and out-patients were the highest yet recorded, being 2435 and 37,844 respectively. Each patient stayed 27 days on an average, and 90 per cent. of the beds (182·5) were on an average occupied daily. 595 patients were sent to the convalescent home. The ordinary receipts, £10,727, are the lowest for many years, and the expenditure, £14,987, is the highest on record. This means a serious deficiency of £4260. The sheriff, in moving the adoption of the report, said that the fall in income was due largely to a failure of the contributions from legacies without a corresponding increase in donations. He asked for a large increase in the subscription list, and alluded to the considerable share taken in this by the contributions of workpeople at the various factories. The adoption was seconded by Mr. Joseph Storrs Fry, the president of the hospital, and agreed to.

The University of Bristol.

The Bill for transferring the property and liabilities of University College to the University of Bristol has passed the examiners in the House of Lords and now awaits its second reading. Mr. D. Pass, son of the late Mr. Alfred Capper Pass, who contributed £4000 to the University scheme, has added £6000 to this, providing £10,000 for the endowment of a chair of chemistry. The Bristol Hairdressers' Association has recently decided to grant £20 to University College for a research into the nature and means of prevention of sycosis barbæ. This, it is hoped, will constitute an example to other industries of the help they may expect from the University as a centre of scientific investigation.

March 16th.

MANCHESTER.

(FROM OUR OWN CORRESPONDENT.)

Infantile Death-rates.

Dr. A. Kershaw in his thirty-fourth annual report on the health of Farnworth states that he was disappointed to find that while the infantile death-rate for 1907 was 110 per 1000, that for 1908 was 206, the increase being due to an epidemic of infantile diarrhœa. On the other hand, the neighbouring township of Worsley was more fortunate, Dr. R. Sayers stating that the infant death-rate there was 102 per 1000, as against an average for 13 years of 135, and was the lowest recorded.

A Dangerous Custom.

A recent inquest held on the 11-year old son of a Middlewich salt worker revealed a risk to life, new probably to many, and illustrated the fact that every calling has its own attendant dangers. This boy and a younger brother went to the salt works whilst the men were away and began to cook potatoes in a brine pan, "a habit with boys in those parts." The elder one fell into the almost boiling hot brine. He was rescued after some delay but died in a few days. The verdict was, of course, "Accidental death," and the coroner hoped that the case would prove a warning to others. It cannot be imagined, however, that the warning will long be remembered by the boys of the neighbourhood, who are evidently very much like the "human boy" in general—fond of doing something unusual and out of the ordinary routine—and it would be better if the brine-pits were made less accessible to them.

Lead Poisoning at Stalybridge.

A somewhat unusual case of lead poisoning has recently occupied the attention of the Stalybridge town council. The patient was a girl who had an intense craving for water—from what cause is not stated—and drank large quantities from both hot and cold water taps. On analysis only a "faint trace" of lead was found in the water from the cold water tap, but a "decided trace" in that from the hot water tap, so that the girl would have been comparatively safe if she had been content with the cold water.

Smoke Abatement.

A smoke abatement conference has been, quite appropriately, held in Sheffield, under the presidency of Sir John Bingham. A paper was read by Mr. J. B. C. Ker on the work of the Hamburg Manufacturers' Smoke Abatement Society, which from small beginnings in 1902 has now 258 members and 717 steam boilers under its control. Regular examinations of the boilers and of the methods of working are undertaken by the staff and suggestions made for improvement when required. The education and control are undertaken by firemen instructors. Methods for smoke prevention are being adopted more generally than they were. In most cases the use of an apparatus for automatically regulating the admission of secondary air is found sufficient. A mechanical stoking apparatus is not generally used because English and Scotch unscreened coal can be got in Hamburg at very low prices and gives very good results with simple hand firing. The general conclusion from the Hamburg inquiries seems to be that manufacturing smoke can be greatly reduced by (1) proper supervision of the furnaces and boilers by chemical engineers who have studied the practical side of fuel combustion; and (2) the employment of properly trained stokers for firing the heating appliances.

March 16th.

LIVERPOOL.

(FROM OUR OWN CORRESPONDENT.)

New Maternity Hospital for Liverpool: the Munificence of Sir William Hartley.

THE fortieth annual meeting of the Liverpool Maternity Hospital and Ladies' Charity was held at the town-hall last week under the presidency of the Lord Mayor. There was a very large attendance in anticipation of a generous contribution by Sir William Hartley towards the deficit on the year's working. So well had the real nature of the secret been kept that among the earliest arrivals it was actually believed that Sir William Hartley's generous intention did not extend beyond a contribution of £500. His own announcement of a gift of £15,000 towards the erection of a new hospital came therefore as a joyous surprise to the friends of the charity. The report of the board of management showed that the present small hospital was totally inadequate to the crying needs of the numerous applicants for admission. The number of patients attended in the hospital during 1908 was 515, as against 357 in the previous year, 12 being single girls (first cases) admitted for treatment. During the past year the hospital has been so full that cases have had to be refused almost daily. To meet this pressure upon the accommodation four extra beds were added in June, making a total of 23, all of which have been kept in constant use. In the school of midwifery 63 pupils were trained during the year; 34 of these pupils were, in addition, trained in the hospital as monthly nurses and received certificates of competency. The committee will

appeal for an endowment fund of £20,000, towards which Mr. T. Sutton Timmis has given £1000. The sale of the existing hospital would provide a site for the new building.

Revival of the Professorship of Forensic Medicine at the University of Liverpool.

The council of the University having decided to re-establish the chair of forensic medicine, held for many years by Mr. Frank T. Paul, now emeritus professor, appointed Dr. R. J. M. Buchanan, who, since Mr. Paul's retirement three years ago, has held a lectureship in the subject in the University. Dr. Buchanan was a distinguished student of University College, Liverpool, and is the fourth old student to receive a professorship in the University in which he was trained, the others being Professor John Hill Abram, Professor H. E. Annett, and Professor Ramsay Muir. Professor Buchanan, who is the senior assistant physician at the Royal Infirmary, was demonstrator in forensic medicine from 1895 to 1906, and consequently has had an extended experience of teaching work. The appointment has given much satisfaction.

The City Council and the Ravages of Tuberculosis.

The special committee of the city council appointed to consider what further measures it is possible to devise against the ravages of phthisis met for the second time on March 10th and deliberated upon a report by Dr. E. W. Hope (the medical officer of health) on the measures adopted up to date. It appeared that one out of every nine deaths in Liverpool is due to some form of tuberculosis, which is a higher mortality rate than from all zymotic diseases. More effective methods than those already tried would therefore seem imperative, and prevention as well as treatment will doubtless occupy the attention of the special committee.

Epidemic of Measles: Liverpool Schools Closed.

As the result of the serious proportions assumed by an outbreak of measles in Liverpool, the education committee, acting upon the advice of Dr. Hope, issued an order on March 15th, whereby all the infant schools in the city will be closed for two weeks. As many as 39,000 children are to be kept at home. Drastic action was considered desirable consequent upon the steadily increasing number of cases.

Liverpool and Tropical Medicine: Official Report on Last Year's Work.

A Blue Book concerning the report of the Advisory Committee for the Tropical Diseases Fund for the year 1908 was issued at the beginning of the month. This shows that the revenue of the fund (including a contribution of £1000 from the Imperial Government) was £3400, and the expenditure (which includes a grant of £1000 to the Liverpool School of Tropical Medicine) £3583 6*s.* 8*d.*, the difference of £183 6*s.* 8*d.* being defrayed from the accumulated suplus of the fund.

March 16th.

NEWCASTLE-UPON-TYNE.

(FROM OUR OWN CORRESPONDENT.)

The Lectureship on Medical Jurisprudence.

THE lectureship on medical jurisprudence has been vacant since the end of last summer session. The obvious thing for the governing body of the College of Medicine to have done would be to have at once advertised the vacancy and invited applications from suitable candidates for the appointment. This, however, was not done for reasons which may or may not be apparent. In any case, the action of the College in failing to make an appointment in the meanwhile has been the subject of keen adverse criticism. And this apparently with good reason. The summer session, when the lectures on medical jurisprudence are delivered, commences on April 20th, that is, in about five weeks' time. It is less than a fortnight ago that a notice appeared in the College and in the infirmary stating that applications for the lectureship must be received by March 17th. But I have been unable to find any advertisement in the press. Even if the appointment be made forthwith the person appointed will have about five weeks only in which to prepare his course of lectures. The course consists of 42 lectures and covers a wide ground, including toxicology. But in spite of this the appointment has been delayed for some eight months until within five weeks of the beginning of the session. The vacancy should have been publicly announced months ago. It cannot be a good thing for a college that healthy competition for appointments on its teaching staff should be stifled. Moreover, in view of changes which are contemplated in the constitution of the University and of the College the latter would have been better advised to make the appointment to the lectureship on medical jurisprudence under conditions not so open to criticism.

The Infirmary Chapel.

At the annual court of governors of the Royal Victoria Infirmary held on Feb. 28th the question of the chapel was again under discussion. The matters in dispute between the house committee and the Free Church Council—namely, the validity of the consecration and the legality of the expenditure upon the building of the chapel—have already been referred to in some of my former letters. A year ago at their last annual meeting the governors resolved to close both the chapel and the students' lecture-hall against religious services, the latter being used by the Free Churches. Since then no religious services have been held in the infirmary. In the interval the house committee has, through its solicitors, prepared a case upon the points in dispute between the Council of the Free Churches and itself for the opinion of counsel. On the agenda for the last meeting there was a motion dealing with the infirmary chapel standing in the name of Dr. G. H. Hume. At the meeting the Lord Mayor, who was in the chair, said that he had upon his own responsibility consulted the members of the Free Church Council and of the house committee and had found both parties equally desirous of bringing this controversy to an end. They would feel themselves indebted to anybody who could arrange an amicable settlement of the question. He asked them therefore not to deal with the motion on the agenda that day, but to postpone consideration of it for three months in the hope that some solution satisfactory to both parties could be found. And for this purpose he proposed that members selected by the Free Church Council on the one hand, and by the house committee on the other, should meet him in conference, and that if they could agree they should report to the next meeting of the governors in three months' time. The Lord Mayor's proposition was carried by a large majority. Since the meeting the house committee, the Council of the Free Churches and the workmen governors have each nominated four representatives to the conference proposed by the Lord Mayor.

Appointment of Pathologist to the Infirmary and the College.

In a former letter I stated that the infirmary and the College of Medicine had agreed to appoint a joint whole-time pathologist. The medical papers for this week publish an advertisement inviting applications for the position. The salary will be £400 per annum and the successful candidate will be required to lecture on pathology at the College and to act as pathologist to the infirmary. He will also, I understand, be allowed to undertake private work in pathology but will not be allowed to practise medicine or surgery. The appointment is one which should commend itself to men who have had some experience in teaching and post-mortem work. Pathology, as understood in the present connexion, does not include bacteriology. At the College of Medicine there is a separate department of comparative pathology and bacteriology which is partly endowed with the Heath bequest and which is already in charge of a whole-time man. And at the infirmary bacteriology is also separated from "pathology," and the department is conducted by a man who is also in practice. It will be seen, therefore, that the duties of the pathologist and lecturer on pathology will be restricted. A joint committee of the two institutions has been appointed to superintend and to manage all matters connected with the new joint appointment. Sir George Hare Philipson, Professor R. Howden, Mr. C. A. Cochrane (treasurer), and Dr. R. A. Bolam represent the College, while Dr. G. H. Hume, Dr. T. Beattie, Mr. Irvine, and Mr. Blake have been nominated by the infirmary. The committee hopes to be able to secure the services of a man with sufficient energy to reorganise the work at both the institutions and to raise the practice and teaching of pathology to the position which its importance at the present day demands. Further particulars of the appointment may be obtained from the house governor of the infirmary, to whom all applications must be sent by March 27th.

Chairmanship of the Royal Victoria Infirmary.

At a meeting of the house committee held on March 4th the resignation of Lord Armstrong of his position of chairman of the infirmary was received with much regret. Mr. W. J. Sanderson, ex-Lord Mayor, proposed that Sir George Hare Philipson should be appointed to the chairmanship, which was unanimously agreed to. Mr. Sanderson was unanimously elected vice-chairman. Sir George Hare Philipson, it may be noted, has been vice-chairman for 17 years.

March 16th.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

Pulmonary Phthisis and Compulsory Notification in Aberdeenshire.

A MEETING of the local authorities was held on March 12th in Aberdeen to discuss pulmonary phthisis. Dr. J. P. Watt, medical officer of the county, reviewed the situation and urged the necessity for compulsory notification, emphasising the point, however, that notification is only a means to an end and will fail of its object if treatment in hospitals and sanatoriums is not obtainable. The chairman's motion: "That this conference is of opinion that the notification of pulmonary phthisis should be made compulsory, and therefore resolves to recommend the several local authorities in the county to take the necessary steps for the introduction of a system of compulsory notification," was seconded, but a direct negative was then moved. After some discussion it was objected that the meeting was purely a conference and that those present had no power to commit the various boards of which they were representatives to anything. The proposal was made to adjourn the meeting, and this was ultimately carried by a majority of 12 votes against 10, although the chairman had explained that the object of the meeting was to ascertain the general feeling and thereafter to submit a resolution to the local authorities. The conference accordingly rose. In addition to the motion proposed by the chairman, there were other five motions on the agenda for the consideration of the conference: The second motion recommended that following upon a system of compulsory notification all notified cases should be followed up by the officers of the local authority in coöperation with the patient's doctor, with the view of taking such steps as were necessary to prevent the spread of the disease; the third recommended disinfection by the local authority whenever necessary, and the notification by registrars of deaths from phthisis for this purpose; the fourth recommended hospital accommodation for advanced cases; the fifth recommended that an effort should be made by the city of Aberdeen, and the counties of Aberdeen, Banff, and Kincardine, acting in combination, to raise a sum of money sufficient to build a sanatorium for the district; such sanatorium to be maintained partly by the various local authorities and partly by paying patients, and that a small subcommittee should be appointed for the purpose of approaching these local authorities on the subject; and the sixth recommended that the Government should be requested to make a grant to all public health authorities who take steps to deal with the disease.

Aberdeen Dispensary: Annual Meeting.

The annual report of the managers of the Aberdeen Dispensary, Maternity Hospital, and Vaccine Institution, which was adopted at a recent meeting, shows that 13,877 cases were treated during 1908, and that 58,950 prescriptions had been dispensed. Lord Provost Wilson, the chairman, said that steps should be taken to lessen the applications for medicines which were often undoubtedly squandered. As a remedy he suggested that the cost price of the medicines should be charged. The medical officers were reappointed for the ensuing year. The financial statement showed a deficiency of £646 on the year's working.

The Municipalisation of Sidlaw Sanatorium.

At a recent meeting of the Dundee town council consideration took place of the draft agreement between the directorate of the Sidlaw Sanatorium and the public health committee as to the municipalisation of the sanatorium at Auchterhouse. After considerable discussion the report of the committee was adopted by 21 votes to 3.

Dundee Infirmary Deficit.

Mr. William Rettie, chairman of the directors of the Dundee Royal Infirmary, has received a letter from Mr. Robert Fleming intimating the gift of £200 towards meeting the shortage of £3000 on last year's income. The directors recorded their warm appreciation of the gift and expressed the hope that by May, when the present financial year ends, the fund, which now amounts to over £1200, would be materially increased.

Bequests to Medical Charities.

Among the legacies bequeathed by the late Mr. James Jamieson, Arbroath, are £3000 to Arbroath Infirmary, £1000 to Arbroath Convalescent House, £1000 to Aberlour Orphanage, £3000 to form a Christmas charity, £300 each to seven local missions and charities, and £400 each for the Forfarshire Mission for the Blind and the Dundee Institution for the Deaf and Dumb. The interest of the residue of his estate, computed at £30,000 or thereby, is to be divided every year among men and women of fallen fortune and among respectable poor of the town and district. It is estimated that the sum left for public purposes will ultimately reach the total of nearly £50,000. Among the bequests of the late Mrs. Elizabeth Margaret Black, of Bon Accord-terrace, Aberdeen, are £100 to the Aberdeen Royal Infirmary, £100 to the Aberdeen Royal Asylum for the Blind, and £100 to the Aberdeen Hospital for the relief of persons labouring under incurable diseases.

Death of Dr. William S. Park.

Dr. W. S. Park, who died at Queenstown, Cape Colony, on Feb. 11th, graduated at the University of Aberdeen and about 18 years ago went to South Africa, where he settled in Lady Frere. Shortly before his death, at the early age of 44 years, Dr. Park had undergone an operation in Queenstown. He is survived by a widow and three sons.

March 16th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

The Belfast Primary Schools.

SOME years ago the reports of the Commissioners of National Education in Ireland revealed the fact that in the matter of elementary sanitation the schools in many parts of Ireland were in a deplorable condition owing to overcrowding, bad ventilation, neglect of school cleaning, and of lavatory arrangements. Special condemnation was made of the schools in Belfast, and in the Belfast Health Commission this was emphasised, for the Commission reported—

> We are of opinion that no effective progress will be made until the ratepayers are called upon to take their share of the burden of education. Meanwhile we can only advise the corporation to rigorously enforce the powers they have under the Public Health and local Acts, and to require that their own regulations shall be observed in all plans for new schools submitted to them for approval.

In the general reports made by the inspectors of the National Board of Education in Ireland just presented to Parliament for the school year ending June 30th, 1908, it is clear that more stringent heed must be paid to the sanitary state of the primary schools all over Ireland. A senior inspector (Mr. P. J. Kelly) says of Belfast: "Allowing 10 square feet per pupil, the accommodation is insufficient in about 27·7 per cent. of the city schools, in 24 per cent. it is fair, and in 48·3 per cent. it is ample." He found one school where with floor space for 232 there were 331 pupils present. The "class-rooms," he says, "are often greatly overcrowded." The ventilation in many of the schools was poor and in one school "the children were crammed into the class-room for singing, several of them being squatted on the floor." During the scare of spotted fever last year "the public health authorities," an assistant inspector reports, "became actively interested in the sanitary condition of the schools." But for this fright the sanitary condition of the schools which were taken in hand would have been completely ignored. The inspector of the Sligo district says, "sanitation seems to take care of itself." He mentions that "sometimes no closets are attached to the schools, which, however, then present less danger to health

than when offices are provided and make it possible for the germs of disease to fructify through insufficient supervision. Sometimes, again, offices are not in use because of their unsuitable or elementary character. At the best a minimum of attention is given to these structures, which are constantly a source of embarrassment at visits of inspection." On March 10th a deputation from the National School Teachers of Ireland waited on the Chancellor of the Exchequer and the Chief Secretary for Ireland at the House of Commons asking for a revision of the pension system and that something should be done to make the schools more comfortable and more sanitary. A large number of Members of Parliament of all shades of politics accompanied this deputation. Mr. Lloyd-George, while sympathetic, thought that the heating, lighting, and ventilation of the schools should be a local obligation; while Mr. Birrell, feeling that subscriptions of a voluntary nature could not be relied on, added that if the Treasury would not give the money it would be necessary to consider whether a measure authorising school attendance bodies to charge the expenditure on heating and ventilation should not be passed.

The Irish Tuberculosis Van.

A most unfortunate accident, due to "something going wrong with the stove," led to the destruction at Lifford on March 15th of the tuberculosis caravan "Eire" which has since autumn been touring through the country. The charts, exhibits, gramophone, literature, and the clothes and other personal property of the lecturer and van attendants were entirely destroyed, but, fortunately, the attendants themselves and the horses were saved. The lectures given in connexion with the van will go on as usual for this week as arranged, and it is hoped that some plan will be immediately devised for replacing the van or for continuing its work in the western districts of Ireland whither it was bound. Since the caravan started in November it has been visited by about 70,000 people who have evinced the greatest interest in the lectures and demonstrations.

Limerick: Abattoir Needed; Food Inspection Peculiarly Defective.

A meeting of the public health committee was held in Limerick on March 11th, and a letter was read from the Local Government Board which stated that in consequence of the evidence given at the inquest on the bodies of the nine children who died last November at the Mount St. Vincent Orphanage from the effects of food poisoning, they had instructed their medical inspector, Sir J. Acheson MacCullagh, to inquire into the arrangements for meat inspection in the county borough. Sir Acheson MacCullagh had quite recently submitted his report to the Local Government Board; and the main purport of it was that there was no regular inspection of slaughter-houses except that done by the sanitary sub-officers. The inspector of food sometimes visited them, but his attention was chiefly directed to stalls where meat was exposed for sale. It was pointed out, too, that there was no abattoir in Limerick; also that the slaughter-houses were not registered, and that the by-laws regarding them, although adopted, were never inforced. In the course of its comment on the report the letter of the Local Government Board proceeded to observe that it was obvious that the corporation had devoted but insufficient attention to this important aspect of public health administration, and strongly urged that it should henceforward receive active and very prompt consideration. A brief discussion of the subject by the committee was then closed by making an order giving instructions to have the by-laws more stringently observed.

March 16th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

An Epidemic of Typhoid Fever due to Infection from Drinkshops.

FOR the last four weeks there has been a serious epidemic of typhoid fever among the garrison of Cherbourg. The incidence of the disease has fallen equally upon the troops in barracks and upon the seamen on board the warships in the harbour. So serious was the aspect of affairs that the Under Secretary for War, M. Cheron, himself went to Cherbourg to hold an inquiry. He found that the water supplied to the barracks came from an unimpeachable source and that supplied to the ships was distilled, so that these two supplies were exonerated. It was thus evident that the source of infection must lie in the supplies furnished to the soldiers and sailors in the towns and suburbs. The inquiry showed that in nearly all the drinkshops the drinking water supplied came from wells which were often infected by drainage from privies or dung-pits. M. Cheron, therefore, issued an order forbidding the troops to enter any drinkshop unless it could be shown that it was supplied with water from a spring. This order brought about a violent protest from all the drinkshops and purveyors of food in the town. Meetings were called at which the deputies for Cherbourg presided and delegations to Parliament were sent. M. Cheron, however, sticks to his guns and has sent to Cherbourg a sanitary commission, composed of hygienists and inspectors in the military health department, to inquire into the water-supplies of all the drinkshops. If the subject does come up in Parliament it will be interesting to see how the deputies for the town will act. The political influence exercised by the drink trade in France is enormous, and members of Parliament are very shy in interfering with it.

The Treatment of Gangrene by Hot Air.

M. Tuffier read a paper upon the above subject at a recent meeting of the Society of Surgery. He said that there were three methods of carrying out this treatment—one by air heated to the temperature of the body, one by air heated to a temperature of 100° C., and the third by air at a temperature of from 500° to 700° C. In two patients who were threatened with gangrene of the leg he used the first method, the air being at a temperature of 50° C. The first patient did very well but the second, who was diabetic, died in a few days. For advanced gangrene M. Tuffier is a great advocate for the use of air heated to 300° C. or more. He treated in this way a patient with gangrene of the dorsum of the foot. Locally the result was good, but the general toxæmia continued and the patient died within five days. A douche of hot air after the sloughs have separated is useful to promote hyperæmia, although M. Tuffier acknowledged that this condition could be obtained in other ways. He mentioned that more than 50 years ago Guiot had obtained good results by the method in question.

Surgical Treatment of Wounds of the Lung.

At a meeting of the Surgical Society held on Feb. 24th M. Delorme returned to the subject of surgical intervention in wounds of the lung complicated by hæmorrhage. He defended operative measures from the attacks of those who argue that they give rise to dangerous shock and are wont to bring about infection of the pleura. Waiting, he maintained, is just as dangerous as thoracotomy; an operation still imperfect in technique (*mal reglée encore*) which labours under a weight of unsuccess due to imperfect closure of wounds. Pleurisy is not due entirely to surgical interference but is mainly due to infection of the pleura by fragments of clothing. Opening the thorax and direct hæmostasis are called for in cases of abundant or persistent hæmorrhage. A hæmothorax which leads to functional trouble can only be treated in some way which, while enabling the surgeon to evacuate the effused blood, will also enable him to search for and to locate the bleeding points. M. Delorme considers that hæmorrhage due to wounds of the vessels at the root of the lung ought to be treated surgically. He related the case of a patient under the care of M. Demandre of Amiens who secured hæmostasis in a wounded vessel at the root of the lung. The patient had been shot by a revolver and the whole of the left side of his chest was full of blood. His condition was very serious, but M. Demandre turned up an osteo-cutaneous flap and found a small wound on the internal aspect of the lung close to the root. The bleeding point (probably a vein) was secured and the patient made an uneventful recovery except for the fact that at the end of the fifteenth day some sero-sanguinolent fluid escaped from the wound.

Malta Fever.

At a meeting of the Hospitals Medical Society held on March 6th M. Sicard said that in December last year an engineer had consulted him who had arrived from Malaga where he spent some days, and where he had fallen ill with headache, diarrhœa, a raised temperature, and

melæna. There were, however, no rose spots and no irregularities in the temperature oscillations. Sero-diagnosis was negative for typhoid fever, but a blood culture, carried out on the advice of Dr. Chauffard, showed the *Micrococcus melitensis*. The patient was successfully treated with injections of collargol. M. Rist observed that as there is Malta fever at Gibraltar it had very likely extended to Malaga.

March 15th.

ITALY.

(FROM OUR OWN CORRESPONDENT.)

Robbery by Anæsthesia.

BEFORE the Florentine Tribunal last week a young Russian, describing himself as a "medical student," was convicted of various thefts committed in the Hôtel Savoia and sentenced to 14 months' imprisonment, in addition to a fine for being illegally possessed of a revolver. One of his victims deposed that having gone to bed before midnight he did not wake till nearly noon next day, thereby losing an appointment. He had been drugged with chloroform during his sleep, and on awaking in the state of hebetude caused by the anæsthetic (traces of which were found in the apartment) he discovered that his pocket-book containing 470 francs (nearly £19) had been stolen. Another victim had been relieved of 1100 francs (£44). The youth, who, in his defence, claimed to be of good family, the members of which, however, seem to have taken no steps towards his exculpation, is supposed to be of anarchist antecedents and to have adopted criminal means of supplying himself with the "sinews of war," like other adherents of that "interest" in Switzerland and quite recently in London. In fact, after the thefts had been committed, he was on his way to England and was arrested *en route* at Genoa. The incident has evoked much comment as illustrating the dangers to which the travelling world is now subjected, not only in express trains, but in first-class hotels at the hands of *chevaliers d'industrie*, whose "stock in trade" is reinforced from the Pharmacopœia.

Solitary Confinement and its Results.

As a "deterrent" the advocates of the abolition of capital punishment insist on imprisonment for life between four walls. Whether it is efficacious is strenuously denied nowhere more authoritatively than in Italy, where, however, it remains in force. In Great Britain the whole subject of lethal crime and its penalty was discussed by the House of Commons just 40 years ago, and in the Hansard of that day will be found the impressive speech of John Stuart Mill, who threw the weight of his authority into the non-abolitionist scale, first because the gallows or the guillotine was superior as deterrent, and, secondly, because, in the interests of the assassin himself, they were much more humane. The "life in death" of such regicides as Passanante or Bresci, or, indeed, of the inmates of such establishments as that of Montepulo in Tuscany, bears all too eloquent attestation to the British philosopher's contention—the said inmates, as described by humanitarian visitors like Signor Dominione, being reduced to straits, mental and physical, such as to inspire the profoundest pity, even when they do not cut short their sufferings by suicide. The *Secolo* of Milan, under the heading "I Drammi del Cellulare" (the tragedies of the prison cell), gives harrowing details of these sufferings; "altri tentativi di suicidio" (other attempts at suicide) being reported as among the incidents of that most terrible of punishments. The impression remaining on the reader of Signor Dominione's revelations is all in favour of the British practice, so recently endorsed by the French Parliament—revelations all the more cogent as appearing in a democratic organ traditionally wedded to the abolitionist tenets of Beccaria.

The General Elections and the Medical Candidates.

As I write, Italy is in the throes of a general election the political aspects of which it is outside my competence to discuss. One feature of interest, however, in the contests is the enormous number of professional men soliciting the honour of being returned to Parliament. Of these, it goes without saying, the majority are barristers, more or less "unemployed." But the number of medical men, either holding chairs in universities or locally connected with boards of health, is large, larger indeed than usual; and when among them are "past masters" in the healing art like Guido Baccelli of Rome, Angelo Celli also of the Eternal City, and Queirolo of Pisa, it is reassuring to think that (safe to be re-elected as they are held to be) the hygienic interests of the country, to say nothing of those of the profession, will remain in loyal and enlightened keeping, especially in a country so feelingly persuaded of the soundness of Disraeli's watchword—"Sanitas Sanitatum, omnia Sanitas."

A Medical Martyr.

By misadventure, all too common in pathological research, a valuable life has just succumbed at the early age of 27. At Subiano, in Tuscany, Dr. Domenico Magrini had completed the necropsy of a woman who had died through *infezione puerperale* when he accidentally punctured his hand with the operating scissors. Pyæmia of a virulent character ensued and in less than three days carried him off, in spite of every effort to save him. This occurred at Arezzo, his native town, the seat of a clinical school, which is now mourning the loss of one of its ablest and most promising representatives.

Professor Ugolino Mosso.

At Genoa, on March 6th, the lecturer on materia medica in the University, Dr. Ugolino Mosso, died suddenly from internal hæmorrhage. One of a gifted family—his brother being the professor of physiology in the Turin School, Dr. Angelo Mosso, well known for his treatise on the pathology of fatigue—Ugolino was born of comparatively humble parents at Chieri on June 14th, 1854. After the good grounding in the arts faculty for which Turin (thanks to Vallauri and others) was justly famed, he devoted himself to medicine, passed through all the classes of the curriculum with distinction, and took the double qualification in medicine and surgery. After graduation he won in 1887 a travelling scholarship which enabled him to perfect his Italian training by study abroad. Selecting Strasburg as the scene of his post-graduate work, he was for two years a pupil of Professor Schmiedeberg, in whose laboratory he laid the foundation of that proficiency in physio-pharmacology which was destined to enrich Italian medical literature with many an instructive monograph. Appointed in 1891 to the post of *privat-docent* in materia medica in the University of Genoa, he rapidly drew around him a band of able and enthusiastic students, some of whom are already teachers of the same subject in other schools. He was indefatigable in research, often denying himself the normal allowance of sleep or food itself in his eagerness to follow out to its farthest ramifications some tempting line of study, theoretical or clinical. Modest himself, he bowed to no authority outside the ruling of science, and though often assuming a critical, nay an antagonistic, attitude to his contemporaries, he never forfeited a friendship or created an enemy. A collection of his papers read before learned societies and congresses is, I understand, in contemplation, and among these the medical world will recognise many old theses productive of animated and illuminating discussion, notably his monographs on the physiological action of cocaine, of saccharine, of the sugars, and of salicylic acid, and on the variations of the temperature of the human body in diverse conditions, physiological and pathological.

March 15th.

CONSTANTINOPLE.

(FROM OUR OWN CORRESPONDENT.)

"La Pédiatrie en Turquie."

A NEW medical periodical, under the name of *La Pédiatrie en Turquie*, has made its appearance in Constantinople. It is edited by Dr. G. B. Violi, an authority on diseases of children. Half of the periodical is in French, the other half being in Turkish. It is devoted to surgical as well as medical and hygienic matters concerning the ailments of children, and thus fills a gap in the medical literature of Turkey that has been apparent for a long time. I understand that Dr. F. G. Clemow, the medical adviser of the British Embassy and British delegate on the Constantinople Board of Health, has been asked by Dr. Violi to contribute from time to time

information regarding the progress which surgery and medicine make in England in connexion with the diseases of children. Among the contributors on the title-page are mentioned such authorities as Professor Baginsky of Berlin, Professor Johannessen of Christiania, Professor Monti, director of the Polyclinic in Vienna, and M. Laurent, professor of infantile surgery at Brussels. The periodical promises, therefore, to be a success. Of the contributions in the first number, the article *Traitement Chirurgical de l'Idiotie* (Surgical Treatment of Idiocy) by Dr. J. Caraco, and Dr. Victor Bey's essay on the Importance of Infantile Hygiene deserve special mention. The latter article is in Turkish. Reference is also made to Dr. Simonescu's treatment of measles by red light. He found that the action of this light is very beneficial in the evolution of the disease, arresting, even in very grave cases, the signs of broncho-pneumonia and diminishing the high temperature. To obtain these results it is necessary, Dr. Simonescu avers, to have in the sick room the walls, the window-panes, and the bed-covers red.

Deficient Medical Administration.

The following incident illustrates how deficient medical administration is in Turkey. All the local newspapers are commenting on the subject and demand in urgent terms immediate improvement of the condition. A police official of the municipality who was suddenly taken ill asked the authorities of that establishment to be admitted to a hospital. The municipality sent the request to the prefecture of police, expressing itself incompetent to take a decision in the matter. The prefecture of police referred the case, in turn, to the municipality as being the only office that could, and should, afford relief. The poor man in the meantime went from bad to worse and at last died on the steps of the building of the prefecture, awaiting the latter's decision. Medical men are in accord that the man's life could have been saved had immediate action been taken. Such dilatory propensities are seen everywhere in Turkish administration, medical and otherwise, with most mischievous results. It is hoped that the above case will cause the medical authorities to act promptly and decisively in matters concerning the health and life of the population. Another case, though of a different character, shows the same anomaly in looking at the medical necessities of the city's well-being. The School of Medicine at Haidar Pasha used to obtain dead bodies for dissection from the Asylum for the Poor. The bodies of those who died in this asylum unclaimed were sent to the school for anatomical purposes. Now the present Grand-Vizier has issued a command strictly prohibiting this practice as against every religious sentiment of the Moslem world. Anatomy, the worthy Grand-Vizier thinks, should be studied from books only, the practice of dissection being *absolutely unnecessary*. The students are, of course, very dissatisfied with such a restriction and are vigorously protesting.

March 12th.

Obituary.

PETER HORROCKS, M.D. LOND., F.R.C.P. LOND.,

CONSULTING OBSTETRIC PHYSICIAN TO GUY'S HOSPITAL.

Peter Horrocks, whose death we have already announced as occurring on Feb. 28th, was a man who never came into quite the public notice which a similar high professional position often commands, for although he was an eminently successful and admirable gynæcologist, he took no part in medical politics, and although a brilliant writer he possessed the distinction of never having written a book.

He was a son of the late Mr. George Horrocks of Farnworth, near Bolton, was educated at the Owens College, Manchester, and entered as a student at Guy's Hospital in 1873. He had a brilliant career as a student and in 1877 graduated as M.B. with the additional distinction of the gold medal in medicine and honours in obstetric medicine at the University of London. During his period of waiting at the hospital he served the offices of house physician in 1878, later that of demonstrator of anatomy and physician in charge of the electrical department. During this period, too, he was appointed assistant physician at the National Hospital for the Paralysed and Epileptic, and it was mainly due to this appointment that he wrote his excellent article on Reflex Action in Diagnosis which appeared in the "Guy's Hospital Reports" for 1881. On the resignation of Dr. Braxton Hicks in 1883 Horrocks applied for and was appointed to the post of assistant obstetric physician to Guy's Hospital, the post having been left vacant by the promotion of Dr. A. L. Galabin to fill the vacancy left by the retirement of Dr. Hicks. In this branch of his profession he was immediately successful, for though a fearless operator he was eminently careful. Dr. Horrocks was elected a Fellow of the Royal College of Physicians of London in 1889, having taken his Membership in 1880, while in 1901 and 1902 he was president of the Obstetrical Society. In 1898 he delivered the Hunterian Oration of the Hunterian Society, dealing with the placenta and the question of heredity. He discussed the heredity of an individual derived from the germ and also from the sperm, his view being that the united germ and sperm were influenced by the mother through her blood, causing the growing embryo and fœtus to be modified in such a way as to give it additional heredity which might be called intra-maternal heredity. Although, as we have said above, Dr. Horrocks did not enrich medical literature by any book it was from no inability to write. His lectures were models of clear statement and sound sense. We need only refer to two which appeared in our columns, the one on Sterility which appeared in THE LANCET of Jan. 9th, 1904, and the other on Concealed Menstruation which appeared in our issue of May 13th, 1905. These lectures, the matter of which was founded mainly upon Dr. Horrocks's own wide experience, were expressed in simple language set forth with a clearness of detail which made them comparable to the lectures of Watson or Paget. They possessed the same practical worth which made them of great value to all practitioners, and this practical element is well shown in his address on The Midwifery of the Present Day, delivered before the Lambeth division of the British Medical Association and published in the *British Medical Journal* of March 10th, 1906, and the lecture on the Uses of Pessaries published in THE LANCET of June 23rd of the same year.

Apart from his purely professional work Dr. Horrocks found great delight in physical exercise. In his early days he was devoted to boating on the river but latterly he took great pleasure in Alpine climbing and in the year 1894 he had a narrow escape of being killed on the Zinal Rothorn. He and his two guides were roped together when owing to the slipping of a stone they all three fell. One guide was killed, one fell 70 feet into soft snow, while Horrocks himself was left hanging owing to the rope having caught on a pinnacle of rock. The two survivors were fortunately rescued by another party which happened to be higher up on the mountain. His death followed an operation undertaken for the recurrence of a vesical growth, the first symptom of which was a hæmorrhage in the summer of 1907.

Dr. Horrocks was unmarried.

THOMAS EASTON, M.A., M.D., C.M. EDIN.

Dr. Thomas Easton of Southampton, who died on March 4th, had a distinguished career as a medical practitioner, and at the same time kept in close touch with the worlds of letters and philosophy. He had a scholarly acquaintance with the classics, was a diligent student of German writers, and showed a genuine Scottish aptitude for philosophical and theological research. He was an expert in educational matters and he was able to render important service on several large educational bodies. He was, moreover, a generous and considerate helper of the poor, and all who came to him in perplexity or distress knew that their cares would receive at his hands sympathetic and patient attention. He was born in 1859 at Girvan Manse in Scotland, and was the son of the Rev. Matthew George Easton, who later in life became a Doctor of Divinity, and who attained a wide reputation as a minister of the Scottish Free Church. He was educated at Ayr Academy and at Edinburgh University. After taking his M.A. degree he qualified M.B. in 1884. Before commencing practice he proceeded to Berlin, where he pursued his professional studies and acquired an excellent knowledge of the German language. On his return to England he spent some time in

St. Thomas's Hospital and studied to such purpose that in 1886 a thesis on "Manual Treatment of Diseases" procured for him the M.D. degree with honours from Edinburgh University. His first experience as a practitioner was as assistant to Dr. Kelgren, of Eaton-square, but soon an uncle of his, Dr. David Easton, of Stranraer, Wigtownshire, died unexpectedly and left a practice which Dr. Thomas Easton was persuaded to take up. Hence he moved from London to Stranraer and until 1899 he remained there, working very hard and obtaining many public appointments in connexion with the workhouse, the lighthouse, and the reformatory. He was made medical officer for the parish of Leswalt, and became a justice of the peace for the county. The strain of his heavy labours, however, caused a breakdown in health, and a complete change proved to be necessary. He left Stranraer and after a much-needed period of recreation and rest on the Continent he bought a practice in Southampton. He soon established his reputation there and before many months had elapsed he was called upon to take part in the public life of the town, his most conspicuous services being rendered in the cause of education. He became a member of the education committee of the borough and for a time held the responsible office of chairman of its higher education sub-committee. He was also a member of the endowed school governors and of the council of the Hartley University College, where his powerful advocacy did much to maintain the higher work of the college and to secure reform in the administration. All useful educational movements received his sympathy and support; he was one of the original members of the Southampton Record Society and of the Historical Association. Dr. Easton died at the age of 49 years. He married in 1884 and leaves a widow and one daughter.

ROBERT HENRY COALL, L.R.C.P. EDIN. & L.M., L.R.C.S. IREL., L.M. DUB.

WE regret to have to announce the death of Mr. Robert Henry Coall, which took place on Feb. 20th last in Cannes from heart failure following an attack of hæmoptysis and pneumonia. Mr. Coall, who was the son of Mr. Talbot Coall of Kingstown, Dublin, was born on Feb. 20th, 1859. Educated at the Carmichael School, he took the qualifications of L.M. Rotunda Hospital (special certificate) in 1881, L.R.C.S. Irel. in the following year, and in 1884 L.R.C.P. & L.M. Edin. After obtaining his qualifications he became resident medical officer to the City of Dublin Hospital. He afterwards came to England and commenced practice in the country near to Leicester. A few years later, his success having justified the removal, he came to London and took a house in Bedford-square, and as his practice further increased removed to 65, Brook-street, Grosvenor-square, where the illness commenced from the effects of which he ultimately died. It is now some 13 years since an attack of hæmoptysis warned him that the success of his professional career had been bought at too great a sacrifice of strength, and he was obliged to relinquish to an increasing extent the large practice which he had succeeded in building up and to spend more of each year in a warmer climate. Robert Henry Coall was an example of the cultured practitioner of medicine, his patients became his friends, nothing that he could do for their welfare was too much trouble, and although regular attendance of recent years was denied to most, his yearly arrival in the summer was eagerly anticipated by them and his advice highly valued. Few who met him in recent years had any suspicion of the fact that he was an invalid, only his great strength of character and unselfish disposition enabled him to appear as he did. His death has come as a surprise, therefore, and great grief to many. To them it will be a consolation to know that although he died abroad he had devoted friends with him during his last illness and received every attention at the hands of Mr. A. A. Carr of Cannes. We may add that he was also seen in consultation by Sir Dyce Duckworth, Dr. W. Osler, and Professor Lingard.

DEATHS OF EMINENT FOREIGN MEDICAL MEN.—The deaths of the following eminent foreign medical men are announced:—Dr. J. G. Metzger, to whom probably more than anyone else is due the scientific and practical use of massage in the treatment of disease. He was a Dutchman by birth and at first followed the profession of gymnastic instructor. This led him to study medicine and he practised for nearly 20 years, making special use of his knowledge of physical exercises. He afterwards went to Wiesbaden as specialist in massage and was for a time in St. Petersburg. Latterly, however, he settled down in Paris, where, indeed, his death occurred, but he frequently resided in Amsterdam during the summer. His age was 69 years.—Dr. Noesske, *privat-docent* of surgery in the University of Kiel.—Surgeon-General Seggel of Munich, an ophthalmologist and author of many papers not only on the subject of his specialty but on medicine and surgery, both general and military. He was 72 years of age and his death was due to a tramcar accident.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At an ordinary meeting of the Council of the above College on March 11th the under-mentioned diplomas were conferred upon the following gentlemen:—

Diploma of Fellow.—Frederick James Fitzmaurice Barrington, M.B. B.S. Lond., M.R.C.S., L.R.C.P., University College Hospital.

Diploma of Member.—Claude Edward Freer Fortin, M.D., C.M. McGill, McGill University and University College and Middlesex Hospitals.

Licence in Dental Surgery.—Reginald Henry Christmas Baker, Middlesex and National Dental Hospitals; and Henry Vincent Gibbons, Guy's Hospital.

TRINITY COLLEGE, DUBLIN.—At the final examination in Medicine, Part II., held recently, the following candidates were successful:—

Douglas M. Moffat, Albert J. Stals, John D. Kernan, Henry R. Kenny Frederick R. Sayers, Charles G. S. Baronsfeather, Denis J. Stokes, and Charles B. Jones.

FOREIGN UNIVERSITY INTELLIGENCE.—*Baltimore* (Johns Hopkins University): Dr. Freiherr von Pirquet, *privat-docent* in Vienna, whose name is known in connexion with the cutaneous reaction sign in tuberculosis, has been offered the post of Professor of Children's Diseases and Director of the new Children's Hospital of the University.—*Budapest:* Dr. Ludwig Hajos has been recognised as *privat-docent* of Criminal and Psycho-Physiology in the Faculty of Law.—*Göttingen:* Dr. Richard Birnbaum, *oberarzt* of the University Gynæcological Clinic, has been granted the title of Professor.—*Heidelberg:* Dr. Hermann Marx, Assistant in the Otological Clinic, has been recognised as *privat-docent* of Otology.—*Munich:* Dr. M. Hoffmann, Extraordinary Professor of Forensic Medicine, has resigned. Dr. Ernst Rüdin and Dr. Felix Plaut, Assistants in the Clinic for Mental Diseases, have been recognised as *privat-docenten* of Psychiatry.—*Paris:* Dr. Chauffard, *agrégé*, has been appointed Professor of the History of Medicine and Surgery.—*Tübingen:* Dr. Holzbach, Assistant Physician in the University Gynæcological Clinic, has been recognised as *privat-docent* of Midwifery and Gynæcology.

ASSOCIATION OF CERTIFICATED DISPENSERS.—At the annual meeting of this association, which was held recently in the Court-room of the Apothecaries' Hall, Blackfriars, E.C., the attendance was very good and was representative of the Poor-law, hospital, and dispensary services in London. Mr. Montagu Smith (Lewisham Infirmary) presided. In the absence of the treasurer, Mr. Anderson (Whitechapel Infirmary), through bereavement, Mr. Trayner (Hackney Infirmary) moved the adoption of the balance-sheet, which showed the gratifying result of £38 to the credit of the association. The report of the honorary secretary, Mr. A. Howell (Dalston Dispensary), stated that the membership had steadily increased, the numbers at the end of last year being 325. The chief point of interest to the members was the acceptance of an amendment by the Government, through the good offices of Sir William Collins, securing the inclusion in Clause 4 of the Poisons and Pharmacy Bill of holders of the Hall Certificate. The report of the Poor-law Commission just published and the legislation which will eventually follow will give the association useful work in safeguarding, through the proper channels, the interests of those in the service and possibly largely extending those interests. The

committee having been practically re-elected, votes of thanks to the master and wardens for the use of the Court-room and to the chairman for his able services were passed with acclamation.

THE SIXTH FRENCH CONGRESS OF GYNÆCOLOGY, OBSTETRICS, AND PÆDIATRICS.—The sixth meeting of the French Congress of Gynæcology, Obstetrics, and Pædiatrics will be held at Toulouse from Sept. 22nd to 27th, 1910, under the presidency of Professor Kirmisson. The presidents of the sections are as follows: Pædiatrics, Professor Kirmisson; Gynæcology, Professor Hertmann; and Obstetrics, Professor Rouvier of Algiers. All information can be obtained from the general secretary of the Congress, M. Audebert, professor of clinical obstetrics, 1, Place Matabiau, Toulouse.

A NEW RADIUM INSTITUTE.—A benefactor who desires his name to be unknown has bestowed on the University of Heidelberg the sum of 150,000 marks (£7500) for the erection of a radium institute. This institute, according to the *Deutsche Medizinische Wochenschrift*, will be a department of the physical institute of the University and under the direction of Professor Lenard, who has done valuable work in radiology. The institutute will further be in close connexion with the clinics of the University and with the cancer institute. It is expected that by the coöperation of physicists and of medical men radiological studies will be much advanced.

NATIONAL LEAGUE FOR PHYSICAL EDUCATION AND IMPROVEMENT.—A series of lectures under the auspices of this league is in progress. The first was delivered by Mr. Benjamin Broadbent, formerly mayor of Huddersfield, on March 18th, the subject being an Experiment in Baby Saving. On March 24th Mr. F. E. Fremantle, medical officer of Hertfordshire, will give an address at 137, Harley-street, and on the next day the Rev. H. Russell Wakefield will speak on the Poor-law Report in connexion with National Health at 35, Holland Park-avenue, where also Dr. Dawson Williams will lecture on Tuberculosis in Childhood: its Cause and Cure, on April 1st. All these meetings will be held at 3.30 P.M. Information concerning tickets can be obtained from the secretary of the league at 11, Southampton-row, W.C.

REPORT OF THE EDUCATION COMMITTEE OF THE LONDON COUNTY COUNCIL.—At the meeting of the London County Council which was held on March 16th a report was presented by the Education Committee showing that during the period from August 24th to Dec. 19th, 1908, 101 schools were under observation for diphtheria, 505 for scarlet fever, and 492 for measles. Three departments and 34 class-rooms were closed. Dr. Beaton called attention to these figures and asked whether more active measures should not be taken to combat these epidemics. In the course of a year 50,000 children between the ages of three years and 14 years became infected in the schools of London. The Education Committee dealt with a period of four months in a report of five lines. In 1908 the medical section of the committee met twice—once in January and once in December. Dr. Beaton urged that more attention should be paid to the cleanliness of the schools. At present they were only washed once in three weeks and swept once a week. He knew of a case where an outbreak of scarlet fever which had been going on for three months was absolutely stopped when the school was closed and thoroughly disinfected, but the Education Committee had only resorted to this course in a very few cases out of over 1000 schools in which epidemics occurred. He appealed to the chairman to give a promise that he would take the matter up. Mr. Jackson said that a subcommittee dealt with cases as they arose. The Education Committee tried to see that every school was properly inspected. The Education Committee further reported that it was of opinion that in ordinary cases only one meal a day need be provided for necessitous school children, but it recommended that in cases of delicate children or of special necessity it should be open to the children's care committees to provide any child with a lunch of milk and bread or biscuits in addition to a breakfast or dinner, or to give both breakfast and dinner. Dr. Salter moved that the recommendation be referred back to the committee with instructions to inform the children's care committees that the Council desired all necessitous children in its schools to be fed adequately. After a long discussion the amendment was rejected by 72 votes to 36 and the committee's recommendation was adopted, as after further discussion, was the whole report.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Government and Milk Legislation.

A VERY definite pledge has been given by the President of the Local Government Board that he will do his best to pass his Bill dealing with milk-supply this session. The pledge was given during the debate on the London County Council (General Powers) Bill (an account of which will be found on the next page), which sought, amongst other matters, to confer upon that authority wider powers in the inspection of milk. Objection was taken by some Members to this course on the ground that milk-supply ought to be the subject of general legislation undertaken by the Government. Mr. WALTER GUINNESS, who spoke on behalf of the London County Council, made it clear that its proposals were only brought forward pending a national settlement. However, he asked where was the Bill of the Government? Mr. BURNS, in reply, indicated that the legislation of the Government was drafted, and indeed produced from his papers a copy of the Bill which he proposes to introduce. He claimed for it that it would "enable the central department in conjunction with all the other health authorities to deal effectively and uniformly with this very serious problem." In the face of the pledge of the President of the Local Government Board, an indication was given by Mr. GUINNESS that the milk clauses in the London County Council Bill would be dropped. It is expected that Mr. BURNS's Bill will be introduced without much delay.

The International Office of Public Health.

There has been laid on the table of both Houses of Parliament a copy of the international agreement respecting the creation of an international office of public health. It was signed at Rome on Dec. 9th, 1907, and the *procès-verbal* recording the deposit of ratifications is dated Nov. 15th, 1908.

The Ambulance Service in the Metropolis.

The Departmental Committee on the Ambulance Service in the Metropolis has now framed its report. A copy has been presented to Parliament but the text has not yet been issued.

Sale of Margarine Bill.

A Bill "to provide for the further prevention of the fraudulent sale of margarine" has been introduced into the House of Commons by Mr. KILBRIDE. It is supported by Sir FRANCIS CHANNING, Mr. COURTHOPE, Mr. SHACKLETON, and Mr. RICHARDSON.

Deaths from Starvation.

On the motion of Mr. TALBOT there has been ordered by the House of Commons a return showing the number of deaths in England and Wales in the year 1908 upon which a coroner's jury has returned a verdict of "Death from starvation" or "Death accelerated by privation," together with any observations furnished to the Local Government Board by boards of guardians with reference to cases included in the return.

Education (Administrative Provisions) Bill.

The aim of the Education (Administrative Provisions) Bill which has been introduced into the House of Commons by Mr. EDWARD DUNN is to extend the law with regard to the provision of meals for underfed school children. Its scope is explained in a memorandum attached to the Bill. The measure proposes to remove from the education authority the final responsibility for saying whether a child is or is not underfed, and to impose that duty upon the school medical officer, should one exist, the medical officer of health, or other medical official. As the law stands it rests with the education authorities to say whether there are or are not underfed children attending their schools, and in consequence whether the Act should or should not be put into operation. The memorandum states that this has led to uncertainty in administration. Clause 1 of the Bill therefore provides for the medical inspection of children attending a public elementary school at the request of the education committee, a majority of the managers, or the head teacher of the school for the purpose of determining whether a child is suffering by reason of insufficient or improper food. Clause 2 lays down that the medical inspector must examine a child alleged, by the persons authorised, to be suffering from underfeeding; and the head teacher is empowered, pending the report of the inspector, to make temporary provision for the child. The Bill further proposes that the medical inspector must present an annual report on the physical condition of children attending school in his area, and that the report must be published or be open to inspection by ratepayers. An appeal to the Board of Education from the decision of the medical inspector is allowed to not less than one-sixth of the members of the local education

authority. The Bill has the support of Mr. KEIR HARDIE, Mr. J. RAMSAY MACDONALD, and other Members of the Labour party.

London County Council (General Powers) Bill and Milk Legislation.

On the motion that the London County Council (General Powers) Bill be read a second time, Mr. COURTHOPE, in the House of Commons on Thursday, March 11th, moved as an amendment the rejection of the Bill. He said that he took this course on the ground that Part III. of the Bill contained very drastic provisions dealing with milk-supply. A continuation of the present system of piecemeal legislation on milk-supply had become intolerable. If the clauses in the Bill relating to milk were passed, the London County Council would have powers of inspection practically over all the dairy districts in the country, including, he believed, even Cornwall. He contended that all questions of milk-supply should be dealt with by general legislation affecting the whole country and securing uniformity of treatment throughout all districts. This year a Bill dealing with milk-supply had been mentioned in the speech from the Throne. As legislation on the subject was promised by the Government there was every reason to claim that the Bill of the London County Council should not be passed unless the clauses dealing with milk were deleted. It was not as if the London County Council did not already possess considerable powers. In the Bill, which it obtained in 1907, model milk clauses were secured by it. Extraordinary inconvenience was caused to the agricultural community owing to the piecemeal legislation dealing with milk. In the interests of public health, as well as of the producer, this sort of legislation should be stopped and every pressure exerted on His Majesty's Government to induce it to bring in a general milk Bill and place it on the statute book. However, he should say that the agricultural community on whose behalf he was speaking was not opposed in the very least degree to proper precautions being taken and even to the most stringent regulations being set up to secure the interests of the public in the matter of the milk-supply.

Mr. REMNANT seconded the amendment for the rejection of the Bill but did not in his speech touch on the question of milk.

Sir FRANCIS CHANNING said that although he could not support the amendment of the honourable Member for Rye, yet he heartily supported the appeal to the President of the Local Government Board immediately to deal with the question of securing the purity of the supply of milk. Any delay on the part of the Government to deal with the subject generally absolutely justified the central authorities of great cities like London, Manchester, and Liverpool to take steps to safeguard their milk-supply. He held that it would be the fairest way, not only to agriculturists but to the whole community, that this matter should be dealt with on general lines. The interim report recently issued by the Tuberculosis Commission was of such a nature as to show that no class or interest ought to object to the protection of the public in connexion with this question.

Mr. WALTER GUINNESS agreed with the honourable Member for Rye that it would be of the greatest importance that uniformity in milk legislation should be attained. However, the London County Council only brought forward their legislation pending a national settlement. The words of the resolution of the County Council were: "In the opinion of this Council, general legislation for the whole country and more effective legislation is necessary to secure a purer supply of milk." The President of the Local Government Board had said that he intended to introduce a measure shortly on the subject of milk-supply. Where was it? It had not been introduced. Therefore it was felt that no choice was left to the County Council but to bring forward milk clauses again. He had consulted the Director of the Lister Institute on the subject of the relation of milk to infantile mortality and he had come to the conclusion that an enormous amount of this mortality from impure milk was caused by the neglect of the local authorities to put in force the order relating to dairies. There were 327 sanitary authorities which had made no regulations whatever, and even when regulations were made they were too often not put into force. The insanitary conditions often existing with respect to the milking of cows constituted a very grave danger to public health. The Royal Commission on Tuberculosis in its last interim report showed that tuberculous cows may cause tuberculous contamination of milk by faecal matter. The medical officer of health of Islington told him the other day that in the case of a hundred samples of milk which he took manure was by far the most common polluting cause, and that it was present in various quantities in 99 per cent. of the samples. The pollution would not cause much damage if the milk were drunk fresh, but, unfortunately, such milk very often had to travel 132 miles before it reached London, by which time it was often in a very dangerous condition. Under the Bill before the House the London County Council would have powers allowed to it to take samples of the milk at the railway station before it was distributed to the customers, and unless they were taken at the railway stations it was quite impossible to detect from what farm the milk came. When the County Council found that the milk was dirty it was to have powers to proceed for penalties, after finding out the farm from which the milk came. Power was also sought to prohibit the produce of such farms coming to London whilst the nuisance continued. However, the London County Council did not ask for these powers if it was assured that the Government was not only going to bring in a general Bill but intended to pass it.

Mr. BURNS (President of the Local Government Board) said that there was no dispute in any quarter of the House as to the necessity for general action in dealing with the milk-supply. The milk-supply not only of London but of many other towns and even of rural districts was far from satisfactory. It was insufficient in amount, it was badly stored, and was often conveyed and sold in the wrong way by wrong people in not the cleanest of shops or methods. The question was whether action should be taken on the initiative of one centre or by the Government for the country as a whole. Upon that the Government had made up its mind and had said that the unsatisfactory condition of the milk-supply was such that it could no longer be dealt with in this piecemeal fashion at the instance of local authorities, many of which were rich enough to protect themselves, but in the protection of themselves unloaded on poorer communities the very article of a bad quality that the smaller authority was unable to defend itself against. It was pointed out that the County Council was prevented from proceeding with its Bill last year because the Government, although it had promised a Bill, did not produce it last session. That was not his fault. Another form of liquid occupied so much Parliamentary time that the poor milk consumer, and the farmer, and the dairyman were excluded from the purview of both Houses of Parliament, but he hoped for better luck for milk this year. The honourable Member asked, "Where is this Milk Bill?" His answer was "There." [The right honourable gentleman at this point took up a Bill from the table.] It consisted of 20 pages and included provisions embodying the two or three local and sectional matters dealt with in the clauses of the London County Council Bill *plus* a number of other provisions which would enable the Central Department in conjunction with all the other health authorities to deal effectively and uniformly with the very serious problem involved in milk-supply. The Bill of the London County Council had to some extent been represented as an effective method of solving the milk problem of London. He wished it was, but it was not. The Bill enabled the County Council and the borough councils under certain circumstances to inspect milk at railway stations and other places, and it gave them certain powers that the Government in its Bill would be compelled to give them, but they ought to be equipped with other necessary powers. He appealed to the House not to accept the milk clauses of the County Council. He had promised to do his best to get his Bill through the House of Commons this year. It was necessary for such a Bill to be passed because a stage had now been reached when something must be done. The Royal Commission on Tuberculosis had made a number of recommendations which could not be ignored. It had declared that human and bovine tuberculosis could not be distinguished from each other, that no doubt child tuberculosis was the direct result of the bacillus of bovine tuberculosis, and that cow's milk which contained bovine tubercle was clearly the cause of tuberculosis in man. There was another reason stronger yet. It was found that model milk clauses passed at the instance of local authorities in a sectional way for their own protection were not model milk clauses at all. There were found milk orders and dairy orders that did not harmonise, jurisdictions which conflicted, standards that did not tally with each other, varying penalties, conflicting methods of supervision with, in some cases, a maximum of irritation to the farmer and a minimum of good to the milk consumer. Everywhere it was found that dairies, cowsheds, vessels, forms of conveyance, storage, temperature, and the register of dairies, &c., were all in an unsatisfactory condition, and in consequence of that the Government would introduce a Milk Bill. The members of the County Council ought to rest content with that pledge and respond to the invitation of the honourable Member for Rye (Mr. COURTHOPE) to give a guarantee that the milk clauses would be dropped.

Mr. EMMOTT (Chairman of Ways and Means) appealed to the House to come to a decision without any further debate.

Mr. WALTER GUINNESS: We shall gladly accept the suggestion of the honourable Member for the Rye Division.

Mr. COURTHOPE: Under these circumstances I shall ask leave to withdraw my amendment objecting to the Bill.

After further discussion the amendment was negatived without a division and the Bill was read a second time.

The Naval Medical Service.

The recruiting of the Naval Medical Service has for some time been a matter of anxiety to successive Boards of Admiralty. Mr. MCKENNA, the First Lord of the Admiralty, notes this in his explanatory statement on the naval estimates of 1909-1910. He has appointed a committee to inquire into the Naval Medical Service and he announces that it is composed as follows: Admiral Sir John Durnford, K.C.B., D.S.O. (chairman), Inspector-General James Porter, C.B., M.D., M.A. (Medical Director General), Surgeon-General Sir Alfred Keogh, K.C.B., M.D., Mr. J. H. Brooks, Principal Clerk, Sir William W. Cheyne, Bart., C.B., Deputy-Inspector-General William H. Norman, R.N., Mr. G. L. Cheatle, C.B., F.R.C.S., Mr. J. S. Barnes, Admiralty (secretary). The Board of Admiralty hopes with the able assistance of these gentlemen to "devise

some means of putting the Naval Medical Service upon a more satisfactory footing."

Public Health Officers Bill.

Sir WALTER FOSTER's Bill to amend the law relating to the qualification and tenure of medical officers of health and sanitary inspectors has the support of Sir FRANCIS POWELL, Sir JOHN TUKE, and Mr. COOPER. Its main objects are set out in a memorandum. It is designed to secure that none but persons properly qualified shall be appointed as medical officers and sanitary inspectors, and to give them in their tenure of office a similar security to that enjoyed by Poor-law medical officers and metropolitan medical officers of health. It is further explained that as the law stands no qualification is required for a sanitary inspector except in London, and as a general rule a medical officer of health or sanitary inspector is appointed from year to year only, and thus has no true security of tenure. On the other hand, Poor-law medical officers and metropolitan officers of health are not appointed for limited periods only and are removable only by, or with the consent of, the Local Government Board.

HOUSE OF COMMONS.

WEDNESDAY, MARCH 10TH.

Importation of Diseased Foreign Meat.

Mr. BOWERMAN asked the President of the Local Government Board whether his attention had been called to a report presented on March 4th to the Court of Common Council by the medical officer of health of the Port of London on the subject of the continued importation of diseased foreign meat, wherein it was stated that on Feb. 2nd a vessel arrived from the United States with a large consignment of boxed meat, such boxes bearing an official label indicating that they had been inspected and passed by the American authorities as being in sound condition, but of which a large proportion upon inspection proved to be unfit for human consumption; whether he could state or would ascertain and communicate the name of the American firm exporting such diseased meat; and whether it was intended to make representation to the United States Government upon the subject.—Mr. BURNS replied: I have received a copy of the report referred to. It does not mention the name of the firm of exporters, and I do not at present think it necessary to ascertain what it is. I am giving attention to the case, and I shall consider the question of formal representation to the Government of the United States on receipt of some further particulars which have been asked for. I may add that I understand that the representative in this country of the United States Department of Agriculture, which is responsible for meat certification and inspection, is already investigating the matter under instructions from that department.

Seizure of Diseased Carcasses.

Mr. COURTHOPE asked the President of the Local Government Board how many carcasses were seized during 1908 by officers of local sanitary authorities in England and Wales under Section 116 of the Public Health Act, 1875, and Section 47 of the Public Health (London) Act, 1891; how many were condemned by the justices; and how many of those condemned were condemned on account of the animal having suffered from tuberculosis.—Mr. BURNS (by written reply) answered: I am not at present in a position to give the information desired. The medical officers of health have been requested to include in their annual reports for 1908 information as to the action taken under Section 117 of the Public Health Act, 1875, or Section 41 of the Public Health (London) Act, 1891, as the case may be, and they have been also requested to state the number of carcasses and parts of carcasses condemned for tuberculosis. When this information is obtained I shall be happy to grant a return on the subject if the honourable Member will move for it; but I do not expect to receive all the reports for some time to come.

THURSDAY, MARCH 11TH.

Importation of Diseased Foreign Meat.

Mr. GODFREY BARING asked the President of the Local Government Board whether his attention had been called to a report made by the medical officer of the Port of London to the Common Council of the City of London, in which that officer stated that he had found nearly 600 diseased sheep livers in a cargo recently landed from the United States; whether he was aware that the boxes containing these livers had an official label representing that they had been inspected and passed by the United States authorities before exportation; and what action he proposed to take in order to safeguard the consumers of this country from the dangers to public health revealed by these circumstances.—Mr. BURNS answered: I have seen the report and am aware of the statements contained in it to the effect given in the question. This particular case is receiving my attention, but I may state that the action reported by the medical officer of health was taken under the Public Health (Foreign Meat) Regulations which I issued last year for the purpose of preventing danger to the public health from the importation of diseased meat, and which I have every reason to believe will be found effective for the purpose.

Mr. COURTHOPE further asked the right honourable gentleman whether his attention had been called to the report of Dr. Herbert Williams, medical officer of health for the Port of London, on the importation of frozen offal, and to the assertion that much diseased meat was imported in this way under the official seal of the United States Government; and whether, in the interests of the public health, he would prohibit the importation of offal in future.—Mr. BURNS said in reply: My attention has been called to this report. The offal referred to in that report bore an official label indicating that the boxes containing it had been inspected and passed in the United States. The matter is receiving my attention, but I may point out that any label attesting official inspection abroad does not exempt meat of the kind referred to from inspection in this country, and that under the regulations, if it is found to be diseased, it must be either exported or destroyed.

Mr. COURTHOPE: In view of the scientific statement that many cases of cancer have arisen in this country owing to diseased liver, will the right honourable gentleman prohibit the importation of it in future?—Mr. BURNS: I do not think there is any justification for the statement with regard to cancer. The Public Health Regulations of Food, which the House passed a year ago, give us sufficient power to deal with any unsound meat attempted to be brought into this country as we have discovered in this particular case.

Mr. COURTHOPE asked the President of the Local Government Board whether he was aware that many frozen carcasses were imported without the lymphatic glands; and whether, in view of the probability that the lymphatic glands were removed to conceal the fact that the animal had suffered from glandular tuberculosis, he would prohibit the importation of all carcasses which did not contain the lymphatic glands intact and in a healthy condition.—Mr. BURNS replied: I understand that practically it is only in the case of pigs that the entire carcass is imported as frozen meat. The Public Health (Foreign Meat) Regulations deal with cases where the carcass of a pig is imported without the head in its natural state of attachment and is without the lymphatic glands about the throat, and any other parts of the carcass in their natural position. In any such case the medical officer of health and the sanitary authority are required to take such action as will secure that the meat will either be exported or destroyed. The powers conferred by the regulations are, as far as I am aware, duly exercised and they appear to be sufficient to meet the object which the honourable Member has in view.

Mr. COURTHOPE: Is it a fact that the re-export of diseased meat is allowed?

Mr. BURNS: Where it is not destroyed we compel the owners to re-export it. As a rule it is destroyed.

A Case of Glanders in Man.

Mr. COURTHOPE asked the honourable Member for South Somerset, as representing the President of the Board of Agriculture, whether the attention of the Board of Agriculture had been called to the inquest at the Lambeth coroner's court concerning the death of Charles Edward Davis from glanders; and what action had been taken in the matter by the local authority.—Sir E. STRACHEY replied: The Board is aware of the unfortunate circumstances to which the honourable Member refers. The attention of the London County Council was directed to the case and the horses in the stables where the man was employed were at once inspected. Glanders was found to exist and the necessary steps are being taken to deal with the outbreak.

Inflammable Flannelette.

Mr. CECIL HARMSWORTH asked the Secretary of State for the Home Department what were the numbers of fatal and other accidents attributable to the use of the material known as flannelette that had occurred during the last five years respectively; and whether the Home Office had any power to impose restrictions on the use of inflammable materials for children's clothing.—Mr. GLADSTONE replied (by written answer): I am unable to furnish these figures, and the Home Office has no power to impose restrictions. I have, however, asked the Committee on the Law of Coroners, though the subject does not come strictly within its reference, to make special inquiry as to the danger arising from the use of flannelette in articles of clothing, and I understand this is now being done.

The Midwives Act.

Mr. CLYNES asked the President of the Local Government Board, in respect to the working of the Midwives Act, whether the committee of inquiry could be made to include a representative of the National Association of Midwives; and, if not, how it was proposed to make the work of the committee complete and satisfactory.—Mr. BURNS furnished the following written reply: I have been in communication with the Privy Council on this subject, and I find that in the opinion of the Lord President the departmental committee is sufficiently large for the practical objects of the inquiry, and that these would not be served by the addition of representatives of special interests. Their views will be properly considered in connexion with any evidence that may be given. I understand that a letter was sent to the National Association of Midwives at the end of January last intimating that the committee would be pleased to consider any application they might make to tender evidence, but no answer to this invitation has been received.

MONDAY, MARCH 15TH.

Medical Men and Street Casualties.

Mr. WEIR asked the Secretary of State for the Home Department whether, having regard to the fact that medical men received 3*s.* 6*d.* only for attending casualties in the streets, whereas veterinary surgeons received 10*s.* 6*d.* for attending injured horses, he would take such steps as might be necessary to secure the more adequate remuneration of medical men.—Mr. GLADSTONE replied: The cases are not parallel. The fee of 3*s.* 6*d.* (7*s.* 6*d.* after 7 P.M.) paid to medical men represents as much as, or more than, the ordinary practitioner would receive for attending patients of the class whom he is called to attend by the police. For exceptional cases a special fee is sometimes paid. Moreover, the majority of these fees are paid to divisional surgeons, who receive them in large numbers and are besides paid salaries from the police fund. Veterinary surgeons have far fewer cases to attend and have generally greater distances to travel. I am satisfied that the medical men in question do receive "adequate remuneration" for the services which they render.

Mr. WEIR: May I ask the right honourable gentleman whether the lives of three men, or three women, or three children are not supposed to be more valuable than one horse?

No answer was given.

The Importation of Unsound Meat.

Mr. VINCENT KENNEDY asked the President of the Local Government Board whether he would state what quantity of meat alleged to be unsound was re-exported from England in 1906-7-8; if this class of unsound food be destroyed, when did this take place, and under what supervision; if it be re-exported what steps were taken to secure that this actually took place, and was it necessarily despatched to the place where it was originally sent from; and would he state whether it was in any way marked as to its alleged character, such as unsound or diseased.—Mr. BURNS replied: I have no information as to the re-exportation during the period referred to of meat alleged to be unsound. The Public Health (Foreign Meat) Regulations which deal with unsound meat imported into this country did not come into operation until Jan. 1st of the present year. Any destruction of foreign meat under the regulations must take place under the supervision of the medical officer of health, and after the importer has failed to comply within 12 hours with a notice from the sanitary authority

requiring him to give a written undertaking to export the meat at his own expense or prove before a justice that it is not intended for human consumption. If the importer undertakes to export the meat it rests with the sanitary authority to satisfy itself that the exportation takes place. If within three days after the receipt of the undertaking the meat is not exported the sanitary authority must cause it to be destroyed. The meat need not necessarily be despatched to the place from which it was originally sent. It is not required to be marked in any way before it is re-exported.

The Notification of Infectious Diseases.

Mr. TYSON WILSON asked the President of the Local Government Board whether, seeing that during the year 1907 the deaths occurring from three infectious diseases that were not compulsorily notifiable were 30,249, while the deaths from ten infectious diseases that were compulsorily notifiable were only 8629, he could see his way to include the three diseases that were not compulsorily notifiable in the list of those that were, or, otherwise, to remove some of those diseases that had to be notified from the list.—Mr. BURNS furnished the following written answer: I am not empowered by the Infectious Diseases (Notification) Acts, 1889 and 1899, to adopt either of the courses suggested by my honourable friend. It is, however, competent for the sanitary authority of any district, with the approval of the Local Government Board, to order that the Act of 1889 shall apply in their district to any infectious disease other than a disease specifically mentioned in that Act, and the Board have given their approval to orders made by various sanitary authorities extending the Act to the three diseases referred to in the question. The Acts do not apply to London, but there are provisions similar to those contained in them in the Public Health (London) Act, 1891.

TUESDAY, MARCH 16TH.

Vaccination in Ireland.

Answering Mr. JOHN ROBERTSON, Mr. BIRRELL (Chief Secretary to the Lord Lieutenant for Ireland) said that the number of conscientious objectors to vaccination in Ireland was very small and they were not, he understood, generally subjected by guardians to repeated prosecutions. He could not introduce legislation on the subject.

WEDNESDAY, MARCH 17TH.

Lead Poisoning.

Mr. WALTER GUINNESS asked the Secretary of State for the Home Department whether he could state the total number of cases of lead poisoning from all sources during the last four years; how many of these cases were fatal; how many cases exhibited symptoms of paralysis; how many cases had symptoms of brain trouble (encephalopathy); how many persons were disabled; and had experiments on animals, justifying the conclusion that the lead in this disease was more often inhaled than swallowed, contributed to the decision of the Home Office to alter their special rules under the Factory and Workshops Acts for various branches of the lead industry in order to guard against this channel of infection.—Mr. GLADSTONE replied: The total number of cases of lead poisoning reported during the four years ended Dec. 31st last under the Factory and Workshop Act was 2448, of which 114 were fatal. The number of these cases showing symptoms of paralysis was 548, and of encephalopathy 84. The number of persons disabled cannot be stated. There are other sources of lead poisoning outside the scope of the Factory Act of which the most important are house painting and plumbing. 557 cases (including 147 deaths) were reported as occurring in these two industries during the same period, but these reports were made voluntarily and the figures cannot be taken as complete. As regards the last part of the question, the only experiments of which I am aware are some that are now being carried out for the Lead Committee in connexion with the pottery industry. They have special reference to the question of the channel of absorption, but are not yet completed. They have not, of course, had anything to do with the revision during the last two or three years of various codes of special rules for different industries in which lead is used; but these rules contain precautions which are effective against both channels of infection. There has been no single "decision" to revise these codes. It has been the general policy of the department to bring the older rules, as occasion arises, up to a modern standard.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

BERRY, CECIL, L.R.C.P. & S. Edin., has been appointed Assistant School Medical Officer by the Education Committee of the County Borough of Wigan.

BERRY, WILLIAM, F.R.C.S. Irel., D.P.H., has been appointed Superintendent School Medical Officer by the Education Committee of the County Borough of Wigan.

BROWN, MARY, M.B., Ch.B. Edin., has been appointed Pathologist and Third Assistant Medical Officer at Stirling District Asylum, Larbert.

DAVIS, H., Junr., M.R.C.S., L.R.C.P. Lond., has been appointed Certifying Surgeon under the Factory and Workshop Act for the Callington District of the county of Cornwall.

DODD, STANLEY, M.B., B.C. Cantab., M.R.C.P. Lond., F.R.C.S. Edin., has been appointed Surgeon to Out-patients at the Chelsea Hospital for Women.

GEMMILL, WILLIAM, M.B., Ch.B. Edin., has been appointed Senior Assistant Physician to Ayr District Asylum.

GIBBS, STANLEY RIDER, L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer for the Second District by the Barnstaple (Devon) Board of Guardians.

HARMAN, N. BISHOP, M.B. Cantab., F.R.C.S. Eng., has been appointed Assistant Ophthalmic Surgeon to the West London Hospital, and Lecturer in Ophthalmology to the Post-Graduate College.

HARRIS, DAVID FRASER, M.D. Glasg., B.Sc. Lond., F.R.S.E., has been appointed Lecturer in Physiology in the University of Birmingham.

KAUFFMAN, OTTO JACKSON, M.D. Lond., has been appointed a Medical Referee under the Workmen's Compensation Act, 1906, for County Court Circuit No. 21.

MACKINNON, CHARLES, M.B., C.M. Glasg., has been appointed Medical Officer and Public Vaccinator by the Cirencester (Gloucestershire) Board of Guardians.

MILLAR, W., M.B., M.S. Edin., has been appointed Certifying Surgeon under the Factory and Workshop Act for the South Cave District of the county of York.

NICHOLSON, GILBERT W., B.C. Cantab., has been appointed First Assistant to the Research Department at the Cancer Hospital, Fulham-road, S.W.

ROBERTS, W. EDGAR, M.R.C.S. Eng., L.R.C.P. Lond., has been appointed Senior Casualty Officer to the Royal Infirmary, Hull.

ROBERTSON, F. GORDON, M.B., Ch.B. Glasg., has been appointed Junior Assistant Physician to Ayr District Asylum.

SMITH, A. LIONEL, M.B., B.C. Cantab., M.R.C.P., has been appointed Honorary Obstetric Physician to the St. Marylebone General Dispensary.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

ALL SAINTS' HOSPITAL FOR OUT-PATIENTS, Buxton-street, E.—Honorary Medical Officer.

BARNSLEY, BECKETT HOSPITAL.—House Surgeon, unmarried. Salary £100 per annum, with board and lodging.

BIRMINGHAM AND MIDLAND FREE HOSPITAL FOR SICK CHILDREN.—Resident Medical Officer, also Resident Surgical Officer. Salary in each case £80 per annum, with board, washing, and attendance.

BIRMINGHAM, QUEEN'S HOSPITAL.—House Surgeon for six months. Salary at rate of £50 per annum, with board, lodging, and washing.

BRIGHTON, ROYAL ALEXANDRA HOSPITAL FOR SICK CHILDREN, Dyke-road.—House Surgeon for six months. Salary at rate of £80 per annum, with board, lodging, and washing.

BRISTOL ROYAL HOSPITAL FOR SICK CHILDREN AND WOMEN.—Assistant House Surgeon. Salary £50 per annum, with board, rooms, and attendance.

BURY ST. EDMUNDS, WEST SUFFOLK GENERAL HOSPITAL.—House Surgeon, unmarried. Salary £100 per annum, with board and lodging.

CAMBRIDGESHIRE COUNTY COUNCIL.—Assistant School Medical Officer (female). Salary £250 per annum.

CANCER HOSPITAL, Fulham-road, London, S.W.—House Surgeon. Salary £70 per annum. Also Surgical Registrar. Salary £26 5s. per annum.

CENTRAL LONDON OPHTHALMIC HOSPITAL, Gray's Inn-road, W.C.—House Surgeon. Salary at rate of £50 per annum, with board and residence.

CHELSEA HOSPITAL FOR WOMEN, Fulham-road, S.W.—Registrar. Salary £40 per annum.

CHILDREN'S INFIRMARY, Carshalton, Surrey.—Assistant Medical Officer. Salary £150 per annum, with board, lodging, and washing.

EAST LONDON HOSPITAL FOR CHILDREN AND DISPENSARY FOR WOMEN, Shadwell, E.—Second Medical Officer for six months. Salary at rate of £40 per annum, with luncheon and tea.

ESSEX COUNTY COUNCIL.—Three Assistant School Medical Officers. Salary at rate of £250 per annum and travelling expenses.

EVELINA HOSPITAL FOR SICK CHILDREN, Southwark Bridge-road, S.E.—Physician to Out-patients. Also Clinical Assistants.

HAMPSTEAD GENERAL HOSPITAL.—House Physician for six months. Salary at rate of £70 per annum, with board and residence.

HULL, ROYAL INFIRMARY.—House Physician, unmarried. Salary £100 per annum, with board and apartments.

INVERNESS DISTRICT ASYLUM.—Junior Assistant Physician. Salary £100 per annum, with board, lodging, and washing.

KETTERING AND DISTRICT GENERAL HOSPITAL.—Resident Medical Officer, unmarried. Salary £100 per annum, with board, residence, &c.

LEAMINGTON, WARNEFORD, LEAMINGTON, AND SOUTH WARWICKSHIRE GENERAL HOSPITAL.—Senior and Junior Resident Medical Officers. Salary of former £100 and of latter £65 per annum, with board, washing, and apartments.

LEEDS GENERAL INFIRMARY.—Ophthalmic House Surgeon. Salary at rate of £50 per annum, with board, residence, and washing.

LIVERPOOL EYE AND EAR INFIRMARY, Myrtle-street.—Honorary Assistant Surgeon.

LIVERPOOL, ROYAL SOUTHERN HOSPITAL.—House Physician. Salary £60 per annum, with board and residence.

LONDON THROAT HOSPITAL, 204, Great Portland-street, W.—Assistant Surgeon. Also House Surgeon (non-resident) for six months. Salary £50 per annum. Also Anæsthetist.

MANCHESTER WORKHOUSE, Crumpsall.—Assistant Medical Officer. Salary £130 per annum, with apartments, washing, and attendance.

MEDICAL GRADUATES' COLLEGE AND POLYCLINIC, Chenies-street, Gower-street, W.C.—Clinical Pathologist.

MIDDLESEX COUNTY ASYLUM, Napsbury, near St. Albans.—Fourth Assistant Medical Officer. Salary £160 per annum, with apartments, board, washing, and attendance.

MOUNT VERNON HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Hampstead and Northwood, Middlesex.—Senior and Junior Resident Medical Officers. Salary of former £100 per annum and of latter £50 per annum, with board and residence.

NEWCASTLE-UPON-TYNE, ROYAL VICTORIA INFIRMARY, Queen Victoria-road.—Pathologist and Lecturer on Pathology. Salary £400 per annum.

NEW HOSPITAL FOR WOMEN, Euston-road.—Clinical Assistants (female).
NORTHAMPTONSHIRE COUNTY COUNCIL EDUCATION COMMITTEE.—Assistant School Medical Officer. Salary £250 per annum.
NORWICH, NORFOLK AND NORWICH HOSPITAL.—Assistant House Surgeon for six months. Salary £20, with board, lodging, and washing.
PADDINGTON GREEN CHILDREN'S HOSPITAL, London, W.—Honorary Physician to the Skin Department.
ROYAL HOSPITAL FOR DISEASES OF THE CHEST, City-road, E.C.—House Physician for six months. Salary at rate of £60 per annum, with board, lodging, and washing.
ROYAL NAVAL MEDICAL SERVICE.—Examination for 15 Commissions.
ST. BARTHOLOMEW'S HOSPITAL, E.C.—Assistant Pathologist. Salary £300 per annum.
ST. MARK'S HOSPITAL FOR FISTULA AND OTHER DISEASES OF THE RECTUM, City-road, E.C.—Clinical Assistants.
ST. MARYLEBONE GENERAL DISPENSARY, 77, Welbeck-street, Cavendish-square, W.—Honorary Physician. Also Honorary Anæsthetist.
SALFORD ROYAL HOSPITAL.—Junior House Surgeon. Salary at rate of £50 per annum.
SCARBOROUGH HOSPITAL AND DISPENSARY.—Assistant House Surgeon. Salary £80 per annum, with board, residence, and laundry.
SEAMEN'S HOSPITAL SOCIETY, Greenwich.—Two House Physicians and Two House Surgeons. Salary in each case £50 per annum, with board, residence, and washing.
SOUTHAMPTON FREE EYE HOSPITAL.—House Surgeon. Salary £100 per annum, with board and residence.
SOUTHAMPTON, ROYAL SOUTH HANTS AND SOUTHAMPTON HOSPITAL.—Junior House Surgeon. Salary at rate of £60 per annum, with rooms, board, and washing.
SOUTH SHIELDS, INGHAM INFIRMARY AND SOUTH SHIELDS AND WESTOE DISPENSARY.—Junior House Surgeon. Salary £90 per annum, with residence, board, and washing.
STOCKPORT EDUCATION COMMITTEE.—School Medical Officer. Salary £250 per annum, rising to £300.
STOKE-ON-TRENT, NORTH STAFFORDSHIRE INFIRMARY AND EYE HOSPITAL, Hartshill.—Senior House Surgeon. Salary £100 per annum, with apartments, board, and washing. Also Junior House Surgeon. Salary £50 per annum, with board, apartments, and washing.
TUNBRIDGE WELLS GENERAL HOSPITAL.—Senior Resident Medical Officer, unmarried. Salary £100 per annum, with board, apartments, &c.
VENTNOR, ROYAL NATIONAL HOSPITAL FOR CONSUMPTION.—Assistant Resident Medical Officer, unmarried. Salary £100 per annum, with board and lodging.
WARRINGTON INFIRMARY AND DISPENSARY.—Senior House Surgeon. Salary £120 per annum, with board, residence, and laundry.
WEST LONDON HOSPITAL AND POST-GRADUATE COLLEGE, Hammersmith-road, W.—Clinical Assistants. Also Three Casualty Officers.
WOLVERHAMPTON AND STAFFORDSHIRE GENERAL HOSPITAL.—Resident Medical Officer. Salary £100 per annum, with board, lodging, and laundry.
WORCESTER GENERAL INFIRMARY.—House Physician. Salary £100 per annum, with board, residence, and washing.
YORK, NORTH RIDING ASYLUM, Clifton.—Junior Assistant Medical Officer, unmarried. Salary £150 per annum, with apartments, board, washing, and attendance.

The Chief Inspector of Factories, Home Office, S.W., gives notice of a vacancy as Certifying Surgeon under the Factory and Workshop Act at Bristol, in the county of Gloucester.

Births, Marriages, and Deaths.

BIRTHS.

BUZZARD. On March 13th, at Wimpole-street, W., the wife of E. Farquhar Buzzard, M.D. Oxon., F.R.C.P., of a son.
GARDINER.—On March 14th, at Dunmow, Essex, the wife of Joseph Napier Gardiner, M.D., of a son.
MORTON.—On March 10th, at The Lodge, Southbourne-road, Bournemouth, the wife of James R. Morton, M.B. Lond., M.R.C.S., L.R.C.P., of a daughter.
SIMSON.—On March 12th, at Cheyne Court, Chelsea, the wife of Captain H. Simson, R.A.M.C., of a daughter.
VAN PRAAGH.—On March 13th, at 3, Honeybourne-road, West Hampstead, the wife of Harold Van Praagh, M.D. Lond.—a son (Gordon).

MARRIAGES.

HOWLETT—LANKESTER.—On March 10th, at St. Nicholas Church, East Dereham, John Kitton Howlett, B.A. Camb., L.R.C.P., L.R.C.S. Edin., L.F.P.S. Glasg., to Nellie Elvira Lankester, eldest daughter of Egbert Rougier Early.
TOMKINS—STANTON.—On March 10th, at the parish church, Morden, Surrey, Charles P. Tomkins, L.R.C.P. Irel., of Epsom, to Maud Cornelia, daughter of the late John H. Stanton.

DEATHS.

DAY.—On March 15th, at 3, Surrey-street, Norwich, William Hankes Day, M.R.C.S., L.A.C., eldest son of William Day, Esq., of this city, aged 84. (No flowers, by request.)
DICKINSON.—On the 14th inst., at West Hill, Putney, Charlotte Annie, wife of William Gilbert Dickinson, M.D.
EDWARDS.—On March 11th, at Highcroft, Chipperfield, King's Langley, Edward Noble Edwards, M.R.C.S. Eng., L.S.A., V.D., late Colonel commanding 1st Sussex A.V., Brighton.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

THE REGISTRATION OF RESPIRATORY MOVEMENTS.

To the Editor of THE LANCET.

SIR,—In your issue of Feb. 6th, p. 439, under Answers to Correspondents, I noted your remarks about registering thoracic movements in catalepsy. I thought perhaps I might be able to give the inquirer some assistance if I were to describe a method which I employed to obtain a tracing in a case of Cheyne-Stokes respiration which was under my care while I was a house physician in the Glasgow Western Infirmary.

I had endeavoured to obtain a tracing by means of a Marey's stethograph, but found that the movements of the chest were insufficient to give a proper tracing. I then turned my attention to record the volume of air inspired and expired, and for that purpose I took the monthpiece of a Clover's inhaler. In this I fixed a cork tightly, with a hole in it large enough to carry an ordinary glass tube about three or four inches long. To the free end of this tube I attached a piece of rubber tubing which was carried over the side of the bed and fixed to a Marey's tambour. The lever of this tambour recorded on a very slowly revolving drum in the usual way. The mouthpiece was placed over the open mouth of the patient, the nose being left quite free so that inspiration was left unimpaired. The mouthpiece was found to be rather large for the mouth alone, but this difficulty was easily overcome by packing in a little gauze.

In the case to which I refer the Cheyne-Stokes breathing was extremely well marked and the tracing obtained was a very perfect one. I tried this method in slightly marked cases, but I found that the patient when told to breathe quite easily breathed normally instead. This method I found in all my cases involved practically no discomfort at all to the patient.—I am, Sir, yours faithfully,

Bannu, N.W.F., India. HARRY S. HUTCHISON.

*** Two papers by Dr. M. S. Pembrey and others on Cheyne-Stokes respiration, which were published in the final volume (1907) of the Transactions of the Royal Medical and Chirurgical Society, might interest our correspondent.—ED. L

THE PHILIPPINE ISLANDS.

Mr. H. Horne, acting British Consul at Manila, states in his annual report to the Foreign Office that health conditions in the Archipelago may be said to have improved. A general tendency toward securing the benefits of modern systems and accessories and the application of the most modern principles of sanitation is observable. A general inspection of food and drink was undertaken during the year 1907, with a consequent general improvement in the use of cooked foods and the sterilisation of water. An institution for the purpose of medical instruction was opened in June with 54 male and female students; an appropriation of £24,000 was made to construct a building for the institution, and it is expected that eventually this school will help to form a nucleus for a university to be established later. A new hospital for the insane was opened, with a capacity for 250 patients, to be occupied by the provincial insane at Government expense. During the year a definite plan was finally approved for the segregation of all lepers in the islands upon an island north of Palawan, to be known as the Culion Leper Colony. It is estimated that two years will be necessary to effect the segregation of the lepers and to construct the colony. A law has been passed providing that all suspected lepers shall be examined microscopically before segregation, and making the coöperation of all police and municipal authorities obligatory. An appropriation has been made for a new general hospital, to cost £75,000, consisting of five two-storey pavilions, with a capacity of 300 beds. A special feature of this hospital will be an obstetrical ward for the training of medical students and midwives. The vaccination of the entire population was continued, and about 2,000,000 persons were vaccinated during the year; the decrease in the number of deaths from small-pox was remarkable. Epidemics of cholera and measles took place during the year, though in neither disease was the outbreak severe. No bubonic plague has been found in the islands since April, 1906, this being due no doubt to the strict inspection of shipping maintained at the expense of the Federal Government. The use of opium, cocaine, alpha or beta cocaine, or any derivative or preparation of these drugs, was prohibited by law after March 1st, 1908. The operation of this law has made it necessary to provide a hospital for opium habitués. A large number, mostly Chinese, have been treated at Government expense and pronounced cured.

PROTESTANT HOSPITAL, BARCELONA.

IN connexion with this hospital (inaugurated some 30 years ago by the various Protestant missions in Barcelona for the benefit of the Protestant community there, though no one is refused admission) a new wing was opened a short time ago. Originally the new building was intended for use as an isolation ward for infectious cases, which are very common in the locality; but the main building—an old house of faulty construction and never intended to be used as a hospital—becoming unfit through its walls cracking, it was decided to transfer the general clinical work to the new wing. This structure had been

built for some two years, but had not been furnished owing to lack of funds. An appeal was therefore made by the managers to the foreign inhabitants of the city, with the result that more than £400 were raised, and this enabled the managers to furnish the new wing on up-to-date lines. The hospital has one non-resident medical officer attached to it and a staff of three trained nurses, two of whom are of British nationality.

"THE MOST MAGNIFICENT PASSAGE IN THE BIBLE."

IT is always interesting to know the thoughts of prominent men on great books, and the symposium on "Which is the most magnificent passage in the Bible?" published in a recent issue of *Sunday at Home* includes among its contributors men of science, scholars, and novelists of the highest rank in their several departments. Sir Donald MacAlister, Principal of the University of Glasgow and President of the General Medical Council, chooses the sublime prayer indicative of the perfect Man contained in Chapter xvii. of the Gospel according to St. John, while Sir Oliver Lodge chooses Matt. vi. 10. Professor Flinders Petrie, it is interesting to note, selects I. Kings xviii. and Wisdom ix. The well-known chapter, Eccius. xliv., Apocrypha, beginning "Let us now praise famous men" is chosen by Dr. Sayce, the distinguished professor of Assyriology at Oxford, as one of his selections. Having read the article we cordially agree with the contributor who says, "It is attempting to pick out a star from the Milky Way," but, unlike him, we will not pick it.

LYNN THOMAS AND SKYRME FUND.

THE following subscriptions have been received up to March 11th:—Barnstaple division of the British Medical Association, per Ellis Pearson, £1 17*s.* 6*d.*; Maidstone division of the British Medical Association, per J. A. Gibb, £3 18*s.* 6*d.*; H. G. Pesel, Pickering, 5*s.*

Nurse R.—Old medical books, as a rule, are more or less worthless. Buchan's book, about which our correspondent writes, was published in 1769 at the cost of 6*s.* and proved a great success; we doubt if more could be got for it now.

M.D.—We regret the practice of distributing handbills of the type which our correspondent submits. Medical men connected with the institutions to which they refer should take steps to prevent their circulation.

A Dental Student.—We are unable to publish any anonymous communication upon the matter.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 20, Hanover-square, W.

MONDAY.

ODONTOLOGICAL SECTION (Hon. Secretaries—H. W. Trewby, D. P. Gabell, J. Howard Mummery): at 8 P.M.

Paper:

Mr. Ashley Densham: A Review of the Progress of Dental Science and Literature from the Earliest Times.

TUESDAY.

MEDICAL SECTION (Hon. Secretaries—Herbert P. Hawkins, A. M. Gossage): at 5.30 P.M.

Paper:

Mr. E. C. Hort: Auto-intoxication *versus* Hetero-inoculation in the Treatment of Established Infective Disease, in Pyrexial and in Apyrexial Conditions, as controlled by (1) Clinical Observation; (2) Estimation of the Antitryptic Index.

FRIDAY.

SECTION FOR THE STUDY OF DISEASE IN CHILDREN (Hon. Secretaries—Hugh Lett, E. I. Spriggs, Harold J. Stiles): at 4.30 P.M.

Specimens:

Dr. T. R. Whipham: (1) Congenital Cystic Kidneys; (2) Bullous Purpura following Impetigo.

Dr. George Carpenter: (1) Congenital Morbus Cordis; (2) Jaundice in an Infant.

Cases:

Dr. F. J. Poynton: Case for Diagnosis.

Dr. T. R. Whipham: Transposition of Viscera.

Mr. Macleod Yearsley: Case of Word-deafness.

(And other Cases not yet notified.)

Papers:

Dr. J. Porter Parkinson: Three Cases of Henoch's Purpura.

Dr. W. A. Milligan: On the Occurrence of Leptothrix Bacillus in the Cerebro-spinal Fluid of a Case of Acute Meningitis.

EPIDEMIOLOGICAL SECTION (Hon. Secretaries—W. H. Hamer, G. S. Buchanan): at 8.30 P.M.

Paper:

Fleet-Surgeon W. E. Home, R.N.: On the Discrimination of Unrecognised Diseases and on Overcrowding in Ships.

N.B.—Fellows of the Society are entitled to attend and to speak at all Meetings.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY.—8.30 P.M., Discussion on the Relationship between Coroners and Medical Men (opened by Sir Victor Horsley).

CHILD STUDY SOCIETY LONDON, Parkes Museum, Margaret-street, W.

THURSDAY.—8 P.M., Prof. J. H. Muirhead: The Religious Difficulty in the Light of Mind Study.

HARVEIAN SOCIETY OF LONDON, Stafford Rooms, Titchborne-street, Edgware-road, W.

THURSDAY.—8.30 P.M., Mr. A. J. Pepper: Thirty Years' Hospital Experience and Practice.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East.

TUESDAY AND THURSDAY.—5 P.M., Dr. N. Moore: Rheumatic Fever and Valvular Disease. (Lumleian Lectures).

MEDICAL GRADUATES' COLLEGE AND POLYCLINIC, 22, Chenies-street, W.C.

MONDAY.—4 P.M., Dr. J. M. H. MacLeod: Clinique (Skin). 5.15 P.M., Lecture:—Mr. E. Clarke: The Fundus Oculi (with lantern slides).

TUESDAY.—4 P.M., Dr. E. Cautley: Clinique (Medical). 5.15 P.M., Lecture:—Mr. L. Mummery: The Pathological Causes and Surgical Treatment of some Cases of Severe Chronic Constipation.

WEDNESDAY.—4 P.M., Mr. C. Ryall: Clinique (Surgical). 5.15 P.M. Lecture:—Mr. L. Mummery: The Pathological Causes and Surgical Treatment of some Cases of Severe Chronic Constipation.

THURSDAY.—4 P.M., Sir Jonathan Hutchinson: Clinique (Surgical). 5.15 P.M., Lecture:—Dr. H. Walsham: The Diagnosis of some Obscure Diseases of the Chest by X Rays.

FRIDAY.—4 P.M., Dr. StClair Thomson: Clinique (Throat).

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—10 A.M., Lecture:—Surgical Registrar: Demonstration of Cases in Wards. 12 noon, Pathological Demonstration. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Dunn: Diseases of the Eyes. 2.30 P.M., Operations. 5 P.M., Lecture:—Dr. Saunders: Clinical.

TUESDAY.—10 A.M., Dr. Moullin: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Dr. Davis: Diseases of the Throat, Nose, and Ear. 2.30 P.M., Operations. Dr. Abraham: Diseases of the Skin. 5 P.M., Lecture:—Dr. Low: Insects as Carriers of Disease in Tropical Medicine.

WEDNESDAY.—10 A.M., Dr. Davis: Diseases of the Throat, Nose, and Ear. Dr. Saunders: Diseases of Children. 12.15 P.M., Lecture:—Dr. Pritchard: Practical Medicine. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Harman: Diseases of the Eyes. 2.30 P.M., Operations. Dr. Robinson: Diseases of Women. 5 P.M., Lecture:—Dr. Beddard: Medicine.

THURSDAY.—10 A.M., Lecture:—Surgical Registrar: Demonstration of Cases in Wards. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Dunn: Diseases of the Eyes. 2.30 P.M., Operations. 5 P.M., Lecture:—Mr. Edwards: Clinical.

FRIDAY.—10 A.M., Dr. Moullin: Gynæcological Operations. Lecture:—Medical Registrar: Demonstration of Cases in Wards. 2 P.M., Medical and Surgical Clinics. X Rays. Dr. Davis: Diseases of the Throat, Nose, and Ear. 2.30 P.M., Operations. Dr. Abraham: Diseases of the Skin. 3 P.M., Lecture:—Dr. R. H. Cole: The Medico-legal Aspects of Insanity (at London County Asylum, Hanwell).

SATURDAY.—10 A.M., Dr. Davis: Diseases of the Throat, Nose, and Ear. Dr. Saunders: Diseases of Children. 12.15 P.M., Lecture:—Dr. Pritchard: Practical Medicine. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Harman: Diseases of the Eyes. 2.30 P.M., Operations. Dr. Robinson: Diseases of Women.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10 A.M., Surgical Out-patient (Mr. H. Evans). 2.30 P.M., Medical Out-patient (Dr. T. R. Whipham); Nose, Throat, and Ear (Mr. H. W. Carson); X Rays. 4.30 P.M., Medical In-patient (Dr. A. J. Whiting).

TUESDAY.—Clinic: 10 A.M., Medical Out-patient (Dr. A. G. Auld). 2.30 P.M., Operations (Mr. Carson). Clinics:—Surgical Out-patient (Mr. W. Edmunds); Gynæcological (Dr. A. E. Giles).

WEDNESDAY.—Clinics:—2.30 P.M., Medical Out-patient (Dr. T. R. Whipham); Skin (Dr. G. N. Meachen); Eye (Mr. R. P. Brooks).

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patient (Dr. A. J. Whiting); Surgical (Mr. H. W. Carson); X Rays. 3 P.M., Medical In-patient (Dr. G. P. Chappel).

FRIDAY.—10 A.M., Clinic:—Surgical Out-patient (Mr. H. Evans). 2.30 P.M., Operations (Mr. W. Edmunds). Clinics:—Medical Out-patient (Dr. A. G. Auld); Eye (Mr. R. P. Brooks). 3 P.M., Medical In-patient (Dr. R. M. Leslie).

LONDON SCHOOL OF CLINICAL MEDICINE, Dreadnought Hospital, Greenwich.

MONDAY.—2 P.M., Operations. 2.15 P.M., Dr. C. Jones: Medicine. 3.15 P.M., Mr. Turner: Surgery. 4 P.M., Mr. Lawrence: Ear and Throat. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Ear and Throat.

TUESDAY.—2 P.M., Operations. 2.15 P.M., Dr. R. Wells: Medicine. 3.15 P.M., Mr. Carless: Surgery. 4 P.M., Sir M. Morris: Diseases of the Skin. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Skin.

WEDNESDAY.—2 P.M., Operations. 2.15 P.M., Dr. F. Taylor: Medicine. 3.30 P.M., Mr. Cargill: Ophthalmology. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 11 A.M., Eye.

THURSDAY.—2 P.M., Operations. 2.15 P.M., Dr. G. Rankin: Medicine. 3.15 P.M., Special Lecture:—Sir W. Bennett: Surgery. 4 P.M., Dr. Sale Barker: Radiography. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Ear and Throat.

FRIDAY.—2 P.M., Operations. 2.15 P.M., Dr. R. Bradford: Medicine. 3.15 P.M., Mr. McGavin: Surgery. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Skin.

SATURDAY.—2 P.M., Operations. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 11 A.M., Eye.

WEST-END HOSPITAL FOR DISEASES OF THE NERVOUS SYSTEM, 73, Welbeck-street, W.

MONDAY.—3 P.M., Clinical Demonstration: Dr. H. Campbell.
TUESDAY.—5 P.M., Clinical Demonstration: Dr. P. Stewart.
WEDNESDAY.—3 P.M., Clinical Demonstration: Dr. F. Palmer.
THURSDAY.—3 P.M., Clinical Demonstration: Dr. T. D. Savill.
FRIDAY.—5 P.M., Clinical Demonstration: Dr. E. Macnamara.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, Leicester-square, W.C.

THURSDAY.—6 P.M., Mr. C. Williams: Electro-therapeutic Methods in some Skin Diseases.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C.

TUESDAY.—3.30 P.M., Clinical Lecture:—Mr. L. Paton: Retro-Bulbar Neuritis.
FRIDAY.—3.30 P.M., Clinical Lecture:—Dr. G. Stewart: Disseminated Sclerosis.

LONDON THROAT HOSPITAL, 204, Great Portland-street, W.

WEDNESDAY.—5 P.M., Dr. G. Cathcart: Impaired Movements of the Vocal Cords.

CENTRAL LONDON THROAT AND EAR HOSPITAL, Gray's Inn-road, W.C.

TUESDAY.—3.45 P.M., Lecture:—Mr. G. French: Tracheoscopy, &c.
FRIDAY.—3.45 P.M., Lecture:—Dr. W. Wingrave: Clinical Pathology.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (22nd).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Royal Free (2 P.M.), Guy's (1.30 P.M.), Children, Gt. Ormond-street (9 A.M.), St. Mark's (2.30 P.M.).

TUESDAY (23rd).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Soho-square (2 P.M.), Chelsea (2 P.M.), Central London Throat and Ear (2 P.M.), Children, Gt. Ormond-street (9 A.M. and 2 P.M., Ophthalmic, 2 P.M.), Tottenham (2.30 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

WEDNESDAY (24th).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. George's (Ophthalmic, 1 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Cancer (2 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal Ear (2 P.M.), Royal Orthopædic (3 P.M.), Children, Gt. Ormond-street (9 A.M. and 9.30 A.M., Dental, 2 P.M.), Tottenham (Ophthalmic, 2.30 P.M.), West London (2.30 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

THURSDAY (25th).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal Orthopædic (9 A.M.), Royal Ear (2 P.M.), Children, Gt. Ormond-street (9 A.M. and 2 P.M.), Tottenham (Gynæcological, 2.30 P.M.), West London (2.30 P.M), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

FRIDAY (26th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), Ophthalmic (10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), City Orthopædic (2.30 P.M.), Soho-square (2 P.M.), Children, Gt. Ormond-street (9 A.M., Aural, 2 P.M.), Tottenham (2.30 P.M.), St. Peter's (2 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

SATURDAY (27th).—Royal Free (9 A.M.), London (2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), University College (9.15 A.M.), Charing Cross (2 P.M.), St. George's (1 P.M.), St. Mary's (10 A.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Children, Gt. Ormond-street (9 A.M. and 9.30 A.M.), West London (2.30 P.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospital operations are performed daily.

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METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, March 18th, 1909.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rain-fall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
Mar. 12	29·96	N.E.	...	49	40	35	35	36	Snowing
" 13	29·85	NNW	...	73	43	35	34	36	Fine
" 14	29·35	N.W.	0·13	66	37	33	34	35	Overcast
" 15	29·23	N.W.	0·07	53	38	30	31	32	Cloudy
" 16	29·49	N.	...	63	41	30	...	32	Fine
" 17	29·59	W.	...	77	45	30	31	32	Fine
" 18	29·37	S.E.	...	81	49	32	41	42	Cloudy

During the week marked copies of the following newspapers have been received:—*Gloucestershire Echo, Evening Standard and St. James's Gazette, Yarmouth Independent, Scientific American, Yeovil Gazette, Oldham Standard, Durham Advertiser, Richmond Times, Cardiff Daily Mail, Birmingham Mail, Notts Guardian, Bradford Observer, Wimbledon Gazette, Morning Leader, Wimbledon Boro' News, Westminster Gazette, &c.*

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